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Final Environmental Impact Statement

Noranda Minerals Corp.
Montana Reserves Company
Joint Venture

MONTANORE PROJECT

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Final
Environmental Impact Statement

NORANDA MINERALS CORPORATION
MONTANA RESERVES COMPANY
JOINT VENTURE

MONTANORE PROJECT

OCTOBER, 1992

VOLUME 2
PUBLIC PARTICIPATION
RESPONSES TO PUBLIC COMMENT

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PUBLIC PARTICIPATION

THE agencies determined the scope of the EIS during a formal comment period prior to its preparation. Notification of the agencies' intention to prepare the EIS and announcement of a period during which public comments would be received regarding the EIS scope was published in the *Federal Register* on July 26, 1989 and in local and area newspapers. A public scoping meeting was held on August 9, 1989 in Libby Montana. The meeting was attended by 154 people, including representatives of each of the four lead agencies, and other state and federal agencies. Another meeting was held on February 15, 1990 to discuss Noranda's petition to the Board of Health and Environmental Sciences to change the quality of ambient water. Representatives from the Department of Health and Environmental Sciences explained the issues surrounding the petition and described the decision-making process.

On October 10, 1990, a Draft Environmental Impact Statement for the Montanore Project was released for public review and comment. A Notice of Availability of the Draft EIS was published in the *Federal Register*. A public meeting and open house was held on October 24, 1990, to explain and discuss the contents of the DEIS. The agencies also solicited public comment on the analysis contained in the DEIS. Approximately 170 letters and nearly 1,100 postcards on the DEIS were received by the agencies during the public comment period. These letters were written by citizens, members of environmental and other groups, Noranda, and local, state and federal agencies. Many of the replies simply opposed or supported the project, while some contained substantive comments on specific portions of the DEIS, or requested further analysis.

Following closure of the public comment period, the agencies met with or contacted certain state and federal agencies and environmental groups to discuss their specific comments. The agencies met with the Clark Fork Coalition, the Cabinet Resources Group, the Kootenai Indian Tribe, and the Environmental Protection Agency to clarify their comments, and to describe how the agencies planned to address their concerns. In addition, the KNF met with the U.S. Army Corps of Engineers to discuss alternative siting of the proposed impoundment and necessary wetland mitigation. The KNF also continued consultation and coordination with the U.S. Fish and Wildlife Service concerning mitigation of grizzly bear impacts.

The lead agencies decided to prepare a Supplemental DEIS after reviewing public comments submitted on the DEIS. The decision to issue the Supplement was based on the agencies' desire to ensure that the public and deciding officials had sufficient information on which to evaluate the proposed action and its alternatives. A Notice of Intent to prepare the Supplemental Draft EIS was published in the *Federal Register* on August 16, 1991. The agencies issued the Supplement on November 8, 1991 for public comment. A Notice of Availability of the Draft EIS was published in the *Federal Register* on November 8, 1991. A public meeting and open house were held on December 9, 1991 to solicit public comment on the Supplement. In addition, the agencies accepted written comments on the Supplement during a 45-day public comment period ending December 23, 1991. Following a review of the public comments on the Supplemental DEIS, the agencies decided to proceed with issuing this Final EIS. The FEIS integrates the analysis documented in the Supplemental DEIS with that contained in the DEIS. The agencies' consultation and coordination conducted during the preparation of the FEIS is documented in the KNF Project Record.

DISTRIBUTION AND REVIEW OF THIS EIS

Copies of this FEIS are being provided to about 500 persons, groups, local governments, and agencies that have expressed an interest in the Montanore Project. The mailing list was compiled using the names and addresses of—

- parties who participated in the public meeting or who submitted written comments;
- parties who have requested copies of the EIS;
- agencies, governments, tribes, and companies potentially affected by the proposed operation; and
- agencies and groups consulted during the EIS preparation.

The following agencies, organizations, and people were mailed a copy of this FEIS—

Federal and State Organizations
Federal Energy Regulatory Commission
Federal Highway Administration
Federal Railroad Administration
Idaho Department of Fish and Game
Idaho Department of State Lands
Idaho Division of Environmental Quality
Rural Electrification Administration
Soil Conservation Service
U.S. Army Corps of Engineers
U.S. Bureau of Land Management
U.S. Bureau of Mines
U.S. Department of Agriculture
U.S. Department of Labor
U.S. Department of the Interior
U.S. Department of Transportation
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
U.S. Geological Survey
U.S. Office of Surface Mining
Bonneville Power Administration
Montana Bureau of Mines and Geology
Montana Department of Commerce
Montana Department of Fish, Wildlife and Parks
Montana Department of Highways
Montana Department of Revenue
Montana Governor's Office
Montana Public Service Commission
Montana Secretary of State
Montana State Historic Preservation Office
Confederated Salish-Kootenai Tribe
Kootenai Tribal Council
Kootenai Tribe of Idaho
NW Power Planning Council
Office of Architectural and Environmental Preservation

Federal and State Officials
U.S. Senator Conrad Burns
U.S. Senator Max Baucus
U.S. Representative Patrick Williams
U.S. Representative Ron Marlenee
U.S. Representative Larry LaRocco

Senator George McCallum
Senator Eleanor Vaughn
Representative Barry Stang
Representative Paula Darko
Representative M.L. Peterson
Representative Paul Rapp-Svrcek
Representative Jim Elliott
Lincoln County Commissioners
Sanders County Commissioners

Individuals and Organizations

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Tony Adkins
Mr. J. Akin
Thomas J. Allen
Stuart Allen
Cameron R. Allen
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Kootenai Wildlands Alliance
American Conserv. Realty
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A copy of this EIS can be reviewed at the following locations—
Northern Regional Office, U.S. Forest Service, Missoula, Montana

Supervisor's Office, Kootenai National Forest, Libby, MT

Cabinet Ranger Station, Trout Creek, MT

Libby Ranger Station, Libby, MT

Montana Department of State Lands, Helena, MT

Montana Department of Health and Environmental Sciences, Helena, MT

Montana Department of Natural Resources and Conservation, Helena, MT

Lincoln County Library

Missoula City-County Library

Copies of this document are also available on request from—

Kootenai National Forest
506 U.S. Hwy. 2
Libby, MT 59923

Montana Department of State Lands
Capitol Station
Helena, MT 59620

Montana Department of Natural Resources
and Conservation
1520 East 6th Ave
Helena, MT 59620-2301

Montana Department of Health and Environmental
Sciences
Cogswell Building
Helena, MT 59620

RESPONSES TO PUBLIC COMMENTS

Commenters

The agencies received 230 letters, one petition, and nearly 1,100 postcards with a total of 1,381 signatures concerning the analysis contained in the DEIS and the Supplemental DEIS. Over 75 percent of the letters were local, with the remaining from regional or national commenters.

Three lists are provided on the following pages. The first list is an alphabetical listing of agencies, organizations, and persons submitting comments on the DEIS or the Supplemental DEIS, the assigned letter number, and the assigned comment codes. The letter number is used to indicate the source of the substantive comments. The next list is an index of comment codes to facilitate finding the coded comment and response. The final list provides names of those individuals who signed a petition or sent in a postcard submitted during the public comment period. A subsequent section, *Comments and Responses,* discusses the comment coding in greater detail.

Agency, Organizations or Individuals Submitting Comments

Name	Letter #	Comment Code
AAAuto Mobile Car	105	Thank you for your comment.
Akin, J.	197	17WQ
American Fisheries Society	161	34AF, 2IT, 8TI
Anderson, Maury	245	18TI, 4MI, 23SE, 30WL, 106WQ
Anderson, Ambrosia	183	17WQ
Anderson, Maury	158	2BF, 1RE, 20SE, 31SE, 14TI, 24WL, 69WQ, 127WQ, 128WQ
Assoc. of Forest Service Employees For Environmental Ethic	86	15AF, 1CV, 3CV, 4CV, 1TI, 14TI, 7RC, 8RC, 10RC, 9SE, 6TR, 2VN, 4VN, 5VN, 6VN, 7WE, 8WE, 8WL, 9WL, 69WL, 70WL, 97WL, 100WL, 1WN, 1WQ, 5WQ, 138WQ
Baker, Graeme	29	11TL, 12TL, 22TL, 3WQ, 6WQ, 19WQ, 71WQ
Baker, Graeme	212	9SE, 71WQ

Bargo, Don And Lisa	11	Thank you for your comment.
Bass, Rick	200	1OG, 2SP, 9TR, 5WL, 78WL, 85WL, 57WQ
Bauer, George J.	90	18SE
Beebe, Teddye L.	221	18SE, 17WQ
Beebe, Teddye L. and John K.	99	22WL, 75WL
Beller, Larry H.	193	17WQ, 18WQ
Bernardy, Almarie V.	67	22WL
Bluhm, Joachim and Charlotte	114	22WL, 87WQ
Brebner, Jamie	196	17WQ
Broili, Chris	38	55WL, 56WL, 61WL, 21WQ
Brown, Timothy L.	12	20SE
Brown, Timothy L.	209	Thank you for your comment.
Bullman, Rudolph C.	198	17WQ, 47WQ
Bunton, Jim	109	Thank you for your comment.
Byrns, Dean	124	9RC, 7SE, 22WL, 141WQ
Cabinet Resource Group	102	1TI, 19TI, 6MI, 37MI, 21WQ, 39WQ, 40WQ, 46WQ, 50WQ, 57WQ, 65WQ, 69WQ, 71WQ, 75WQ, 78WQ, 83WQ, 121WQ, 122WQ, 129WQ
Cabinet Resource Group	126	1AQ, 2BF, 3CV, 1TI, 20TI, 6MI, 31SE, 12WL, 22WL, 4WQ, 27WQ, 40WQ, 69WQ, 71WQ, 75WQ, 84WQ, 129WQ
Cabinet Resource Group	137	16MI, 1SE, 13SE, 14SE, 15SE, 17SE, 41SE
Cabinet Resource Group	147	2BF, 24MI, 1RE, 4SE, 15SE, 21SE, 31SE, 7WQ
Cabinet Resource Group	246	1OG, 2OG, 2SP, 3SP, 69WL, 99WL, 101WL, 102WL, 104WL, 107WL
Cabinet Resource Group	248	23WQ, 39WQ, 50WQ, 57WQ, 63WQ, 75WQ, 83WQ, 99WQ, 101WQ, 105WQ, 123WQ, 147WQ
Ceballos, Lorenzo	184	17WQ
Ceballos, Vedo	231	17WQ
Champion International	75	Thank you for your comment.
Chase, Earl	53	22WL
Christensen, Clair	159	22WL
Citizens Against Gated Environments	236	18SE, 30WL, 34WL, 98WL
City Service Company	122	19MI, 22WL
City Service Company	228	5RC, 18SE, 86WL, 17WQ, 18WQ
Clark Fork - Pend Oreille Coalition	227	3AF, 4AF, 8AF, 9AF, 12AF, 19AF, 20AF, 24AF, 33AF, 37AF, 20MI, 1SP, 2SP, 1TI, 12TI, 15WE, 16WE, 2WQ, 4WQ, 6WQ, 11WQ, 12WQ, 13WQ, 22WQ, 24WQ, 27WQ, 28WQ, 37WQ, 38WQ, 43WQ, 44WQ, 45WQ, 48WQ, 50WQ, 69WQ, 71WQ, 73WQ, 74WQ, 75WQ, 76WQ, 88WQ, 91WQ, 92WQ, 99WQ, 101WQ, 102WQ, 104WQ, 106WQ, 109WQ, 111WQ, 112WQ, 113WQ, 114WQ, 115WQ, 116WQ, 117WQ, 118WQ, 119WQ, 133WQ, 139WQ, 143WQ, 147WQ
Clark Fork Coalition	130	43AF, 1BF, 3MI, 20MI, 11SE, 15SE, 33TI, 10VN, 11VN, 2WQ, 4WQ, 7WQ, 12WQ, 38WQ, 49WQ, 54WQ, 71WQ, 75WQ, 96WQ, 102WQ, 133WQ
Clark, Charles	81	2BF, 16TI, 17TI, 13TL, 2VN, 24WL, 72WL
Cleveland, Amy M.	94	1CV, 4CV

Cleveland, Amy M.	203	2TL, 30WL, 90WQ
Collier, Mike	62	22WL
Collinson-Shaw, Brenda L.	69	Thank you for your comment.
Combs, Roger E.	80	Thank you for your comment.
Communities for a Great Northwest	110	19MI, 2RC, 4RC, 9RC, 1SE, 2SE, 5SE, 12SE, 16SE, 18SE, 33SE, 1TL, 11TL, 2VN, 1WL, 22WL, 23WL, 48WL, 73WL, 75WL, 113WL, 116WL, 125WL, 96WQ, 128WQ, 142WQ
Communities for a Great Northwest	223	39SE, 1SP, 54WL, 82WL, 84WL
Confederated Salish & Kootenai Tribes	146	8TI, 96WQ
Confederated Salish & Kootenai Tribes	250	4AF, 20AF, 1IT, 2IT, 87WQ, 90WQ, 91WQ, 96WQ, 106WQ
Cuff, F.	13	1SE, 21WQ, 32WQ, 128WQ
Dahlberg, Jon A.	84	22WL
David L. Cleveland	202	4WE
Davidson, James E.	107	22WL
Dea, Pursi	134	38SE
Decker, Gene	119	4RC, 13RC, 3TE, 22WL, 46WL, 56WL, 69WL, 75WL, 79WL
Decker, Mark L.	188	9WQ
Denning, Ray P.	222	29SE, 47WQ
Denning, Ray P. and Phyllis G.	104	22WL
Denowh, Ron	14	Thank you for your comment.
Department of Energy, Bonneville Power Administration	101	6TL
Dexter, Barry	39	Thank you for your comment.
Dolezal, Larry	15	109WL
Economic Development Council, Inc.	112	2MI, 4RC, 5RC, 22WL, 23WL, 48WL, 58WL, 75WL, 19WQ
Eggleston, Donna	218	34WL
Eggleston, Ed	57	4RC, 5RC, 1SE, 5SE, 16SE, 1TL, 2VN, 22WL, 75WL, 113WL, 96WQ, 142WQ
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Erhard, John	116	22WL
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Form Letter (Post Cards)	40	22WL
Fraser, Maria B.	251	31SE
French, Gregory Mcn.	47	Thank you for your comment.
Friends of the Wild Swan	4	23MI, 2WN

Funsch, Dan	162	3CV
Gerard, George	190	Thank you for your comment.
Golden State Oil	5	22WL, 56WL
Golden State Oil	207	Thank you for your comment.
Golie, Barbara	73	32SE, 22WL
Golie, Jack K.	63	22WL
Goyen, Lenore	27	7TR
Great Bear Foundation	145	5WL, 6WL
Griffiths, Doug	16	59WL
Gruber, Robert R.	97	Thank you for your comment.
Heath, Brent L.	17	22WL
Heath, Brent L.	211	Thank you for your comment.
Heinert, Ralph	28	Thank you for your comment.
Hershberger's Treasure Mtn Fence	125	22WL, 3WN
Hildebrand, Rick	152	9SE, 2VN, 9WE, 1WN, 2WQ, 57WQ, 129WQ
Hildebrand, Sandy	136	18SE, 37SE, 8WL, 6WQ
Hill, Ed	68	22WL
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Hudson, Russell	257	4AF, 13TI, 58WQ, 140WQ
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Iovino, Joe	215	9SE
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James A. Bradbury	34	35MI, 24WQ
Jensen & Mills	144	1WQ, 2WQ, 67WQ, 83WQ
Jensen & Mills	239	4MI, 4WQ, 7WQ, 90WQ, 106WQ, 147WQ
Jewell, Edwin W.	132	22WL
Johnson, E.A.	151	20TL, 2VN, 46WL, 19WQ
Jones, Cedron	128	1CV, 4CV, 2MI, 3MI, 27MI, 12WQ, 49WQ, 54WQ, 75WQ, 79WQ
Journey, Alfred E.	89	2AF, 1SE, 5WL, 6WQ, 19WQ, 133WQ
Kasworm, Wayne	117	11TI, 1MI, 5MI, 37MI, 6RC, 22SE, 4TR, 7TR, 7WL, 29WL, 43WL, 46WL, 47WL, 50WL, 93WL, 94WL, 96WL, 113WL, 54WQ, 71WQ
Kerkvliet, Dale	123	42AF, 1AQ, 2AQ, 1TI, 4VN, 1WN, 2WQ, 19WQ, 54WQ, 75WQ, 133WQ
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Kootenai Transfer & Storage	234	18SE
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Kootenai Tribe Of Idaho	121	34AF, 1IT, 2IT, 6TI, 28TI, 29TI, 30TI, 20MI, 31MI, 7SE, 5TR, 7TR, 2WE, 40WQ, 46WQ, 54WQ, 55WQ, 60WQ, 69WQ, 71WQ, 73WQ, 75WQ, 78WQ, 82WQ, 83WQ, 86WQ, 96WQ, 129WQ, 133WQ, 135WQ, 141WQ, 143WQ, 146WQ, 148WQ
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Libby Area Chamber of Commerce	240	1SP, 22WE
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Libby Placer Mining Company, Inc.	33	1CV, 3CV, 4CV
Libby Placer Mining Company, Inc.	51	4CV, 9CV, 1TI, 14TI, 19TI, 4RC, 1RE, 20SE, 1TL, 2TR, 1VN, 7WE, 8WE, 9WE, 42WL, 47WL, 69WL, 75WQ, 78WQ, 83WQ, 93WQ, 96WQ, 104WQ, 121WQ, 133WQ
Libby Placer Mining Company, Inc.	52	1TI, 14TI, 1RE, 7WE, 10WE, 104WQ
Libby Placer Mining Company, Inc.	87	96WQ
Libby Placer Mining Company, Inc.	201	40AF, 1CV, 2TL, 3TL, 12WE, 13WE, 14WE, 13WL, 18WL, 30WL, 69WL, 10WQ, 103WQ, 104WQ
Libby Placer Mining Company, Inc.	204	4TL, 90WQ
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Lincoln County Commissioners	232	18SE, 1WL, 54WL, 75WL, 17WQ
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Martensen, Norman D.	189	Thank you for your comment.
Martin, Matthew, Hernandez, Erickson, Zimmerman, Griffith	111	Thank you for your comment.
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Mills, Mick	18	25SE, 17TL, 69WQ
Mines Management, Inc.	148	54WQ
Montana Chapter Sierra Club	249	17WE, 14WL, 88WL, 7WQ
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Montana State Senator Eleanor L. Vaughn	129	22WL
Montana State Senator Eleanor L. Vaughn	224	2TL, 18WQ
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Noranda Minerals Corp.	154	2WE, 7WE, 28WL
Noranda Minerals Corp.	155	Thank you for your comment.
Noranda Minerals Corp.	156	Thank you for your comment.
Noranda Minerals Corp.	157	Thank you for your comment.
Noranda Minerals Corp.	258	25AF, 41AF, 12AQ, 5TI, 7TI, 8TI, 9TI, 10TI, 31TI, 32TI, 29MI, 36MI, 38MI, 39MI, 10TL, 3WE, 3WL, 21WL, 40WL, 41WL, 53WL, 80WL, 1WN, 19WQ, 20WQ, 39WQ, 48WQ, 63WQ, 75WQ, 77WQ, 85WQ, 89WQ, 109WQ, 110WQ, 120WQ, 131WQ, 134WQ, 144WQ
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Oltean, Nicholas E.	32	2RC, 111WL, 1WN, 19WQ
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Pearson, Mark	26	8TI, 70WQ, 71WQ
Peck, Carolyn	65	22WL
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Rhodes, Barbara	243	12AF, 103WL, 101WQ
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Snyder, Emily J.	95	22WL
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Sullivan, Laurie	237	Thank you for your comment.
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Sullivan, Neil	217	Thank you for your comment.
Sverdrup & Barnes	133	75WL
Swanson, John R.	76	Thank you for your comment.
Swanson, John R.	219	Thank you for your comment.
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Switzer, Mike	208	Thank you for your comment.
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Individuals Signing Petition or Postcards

Abrahamson, Daryn
Abrahamson, Dori
Abrahamson, Raymond J.
Adamson, Chloe
Afrank, Cathryn
Ague, Kathryn Broden
Ague, Timothy, W.
Alkire, Mary Beth
Allen, Ron
Allossee, X. Jack ?
Alsbury, Margueritte
Ammerman, H.F.

Anderson, Elizabeth
Anderson, Gordon E.
Anderson, John P.
Anderson, Larry
Andreessen, Terry & Carole
Angell, Bryce
Applegate, Marian
Armstrong, Tom
Aucutt, Larry D.
Auger, Donald
Avery, James O.
Azure, Clarence
Azure, Susan
Azure. Re Neva
Bache, Cora Lee
Bachteler, Bert
Bachteler, Darreld S.
Bachteler, Marcie
Bachteler, Thomas
Backen, Evelyn
Baeth, Ken
Baeth, Lora
Baeth, Randall W.
Baker, Terria L.
Barnes, Russell
Barnes, Sandra
Bary, J. R.
Bass, Barbara
Bass, Gerald
Bauer, George J.
Bauer, Neil G.
Beagle, Robert
Beardsley, Joe
Beasley, Anita
Beasley, Robert
Beaudry, Norman
Beck, B. J.
Becker, Steve
Beebe, Harry R.
Beebe, John K.
Beebe, Ronald
Beito, Betty
Bellar, Larry H.
Beller, Kim
Beller, Lester Harris
Beller, Lucy J.
Beller, Sharon K.
Benefield, Scott D.
Benefield, Teri L.
Bennett, Malia
Bentry, Bert
Bergross, Ray
Bernall, Don
Bernhard, Allen F.
Berquart, Steve
Berry, J. R.
Bertelsen, Deborah
Bertelsen, Neil M.
Bertelsen, Phyllis A.
Best, Dennis O.
Best, Jerry L.
Best, Sharon
Bever, Bruce K.
Bilodeau, James
Bischoff, Bill J.
Bitterman, Dwain
Black, Brad A.
Black, Robert J.
Bledsoe, Helen M.
Bledsoe, Otis W.
Blinco, Steve
Bloom, Gerry
Blow, Larry
Blow, Sandra
Blystone, Debra L.
Bohannon, S.D.
Bojhim, Marlenea Kay
Bojhim, William L.
Boka, Will
Bonneau, Frank
Bonneau, Helen
Bonney, Ray
Booth, Barb
Boothman, Daphna
Bosch, Bernard M.
Boswell, Mark
Boyd, Jeannine L.
Boyd, Ted M.
Boykin, Marlena Kay
Boykin, William L.
Bradshaw, Mary
Bramante, Carl
Bramante, Deana
Bramante, Frank
Bramante, Kay J.
Brazington, Lonzetta
Breeding, Charles
Breeding, Wanda
Brickey, Donna
Brickey, James C.
Brickey, James Jr.
Brickey, Marcia
Brineger, W.E.
Brineger, W.L.
Brjaid, Robert L.
Broden, Kim E.
Broden, Roberta J.
Brooks, Gary
Brooks, Joe Jr.
Brooks, Tricia
Brossman, Aaron D.
Brossman, Connie
Brossman, Dan E.
Brossman, Julie K.
Brossman, Randy
Brossman, Raymond D.
Brossman, Rodney L.
Brossman, Wendy
Brothers, Lester D.
Brown, Dennis
Brown, Fred A.
Brown, Ivanell
Brown, Marilee
Brown, Marion
Brown, Warren G.
Brunette, Elaine
Bryant, Robert L.
Bryunt, Verla A.
Buckshaw, Mary
Buff, Rhona
Bundrock, William A.
Bunton, Jim
Burnett, Mel
Burns, Donald L.
Burrell, Beth A.
Burrell, Cathy D.
Burrell, Cheri
Burrell, Louis A.
Burriss, Bill
Burriss, Carol
Butler, Charles
Butterfield, Pat
Cadwell, Grace
Caldwell, Thomas M.
Calhoon, Linda
Calkin, Dala E.
Calkin, George L.
Calkin, Lynn B.
Camp, Caroline
Camp, Joseph G.
Camp, Mrs.
Campbell, Homer N.
Campbell, L.B.
Campbell, Lila A.
Campbell, Roger L.
Cannon, Jo
Cannon, Larry
Cannon, Lisa
Cannon, Stuart
Carlson, Raymond
Carpenter, Alice
Carr, Douglas R.
Carr, Floyd D.
Carr, Loretta E.
Carroll, Charles
Carter, Henry
Carter, Leo
Carter, Sue
Case, Randall C.
Cassel, Lloyd D.
Cassidy, Jack
Challinor, Alice M.
Challinor, Jami
Challinor, Joni
Chandler, Cheryl
Chandler, Joel
Chandler, M.
Chandler, Vernon Lee
Chapman, Dawn L.
Chapman, Mike
Chappel, William J.
Chappel, William J.
Chase, Earl E.
Chase, Shirley
Cherry, Don
Cherry, Joseph E.
Christensen, Art
Christian, Etta J.
Chung, Joesph E.
Chusick, Mick
Chvilicek, Bertha
Chvilicek, Mary Colleen
Clarisfe, Travis
Clawson, Arey
Clawson, Diana
Clemmons, Gloria
Clemmons, Robert L.
Cody, Gayla
Cody, Robert
Colclough, Alan
Cook, David J.
Cook, Jack O.
Cook, Wynn
Cooper, Brenda A.
Cooper, Cindy
Cooper, Gary J.
Corbett, Gayle
Corbett, William S.

Corneluis, Harris G.
Cosgriff, Donna J.
Cosgriff, Edward T.
Cosgriff, Gerald
Cosgriff, Jody
Coverdell, Teresa K.
Cox, Robert E.
Craver, Fran J.
Crill, Jill
Crill, Randy W.
Crill, William
Criner, Gerald R.
Criner, Verna
Cripe, Lillian M.
Crismore, Wm.
Cullen, Kandy
Culver, Floyd F.
Cummings, Carl W.
Cummings, Kip
Cummings, Larry V.
Curtiss, Cynthia
Cymbaluk, Rod
Dahlberg, Linda
Danphner, Francis
Darsow, Joe
Darsow, Richard E.
Davenport, Harold
Davis, Billey Joe
Davis, Hannah C.
Davis, Ray L.
Day, Donald L.
Dean, Gerald E.
Dean, Pierson
Dean, Shirley Ann
Decker, Debra L.
Decker, Mark L.
Dedic, Julie
Dedic, Raymond F.
Delaney, Carol
Delaney, Rod W.
Dempewolf, Bethel
Deshazer, Charlene
Deshazer, Jack O.
Deshazer, Joyce
Deshazer, Margaret A.
Deshazer, Rusty
Deshazer, William
Dettman, James E.
Devlin, James
Dill, Debbie
Disney, Lee A.
Dofelmine, Cynda

Dolezal, Herman
Doney, Charlene
Doney, Charley
Doney, Don
Doney, L.E.
Doney, Leroy
Dotson, Larry W.
Douglas, Bill
Doule's, Darrell
Drake, Heidi
Drury, Bruce D.
Drury, Delano B.
Drury, Marjorie L.
Drury, Tracy L.
Duffy, Victor J.
Dunham, Jon S.
Dunn, Rita
Dutton, Richard C.
Dutton, Russell
Dutton, Vickie
Easley, Gary E.
Easley, Lisa
Echhart, Don
Edwards, Marilyn
Egeland, D.F.
Eggert, Freda M.
Ekstedt, Trueman
Enders, Tim
Erickson, Gary R.
Erickson, Nancy
Erickson, William
Erlandson, Carlene M.
Erlandson, Oscar L. Jr.
Escott, Leona
Esparza, Rande Kay
Evans, Stanley
Fahland, Cindy
Fahland, Felix
Fantossi, Albert
Fantozzi, Marcia
Fehrs, Kim L.
Fellenberg, Ruben
Fennessy, Jerry
Fennessy, Joe
Fennessy, Mark
Fields, Willis D.
Filler, Bob
Filopoulos, John
Finstad, Ray
Fischer, Lyle
Fiscus, Donna R.
Fiscus, Robert L.

Fisher, Fred H.
Fisher, Jerry L.
Fitchett, Calvin
Flansaas, Michael
Fletcher, Jerome E.
Fletcher, Marvin F.
Fontaine, Alan
Fontaine, Janet
Fornall, Donald J.
Frank, Cathryn A.
Franklin, David
Franklin, Randal
Frazer, Roma A.
Frazey, Bill
Frazey, Homer W.
Frazey, Jodi
Fruit, Florence E.
Fruit, Vernon C.
Fulgham, Samuel
Fuller, Robert K.
Gage, Dorothy
Gammengronger, David G.
Garver, J.
Gehring, Lee
Gehrke, Walter A.
Gerard, Linda K.
Gidley, Deborah
Giese, Fred W.
Gilbert, Dulci L.
Gilbert, Ronald D.
Gilbert, Shiela G.
Gilden, Gregg
Gilden, Jim
Gilder, A.J.
Gilman, Martin
Gilman, Susan
Glaze, John
Godin, Richard
Graham, Robert L.
Griffey, David L.
Griffey, Florence
Griffey, Jean
Gring, Donna
Groom, Jim
Grotjohn, Jeffery P.
Grotjohn, Pat
Grunerud, Glen
Grunerud, Wh.
Haaby, Dallas
Habeck, E. Dianne
Habeck, Orville
Hafferman, Agnes

Hafferman, Brian
Hafferman, Elizabeth A.
Hafferman, William C.
Hagen, Clinton D.
Hagen, Eloise D.
Halsey, Hazel
Halsey, Ron
Halsy, Darina
Hamilton, Sherill
Hanley, Barb
Hanpley, John M.
Hanson, Paul
Harple, Rick E.
Harrington, Mick L.
Harris, John K
Hart, Dawn
Hart, Donald E.
Hartman, Mildred M.
Haugan, Mike
Havens, Donna
Havens, R. Eugene
Hawley, Rich
Hawner, Ronald
Hawner, Toni A.
Hays, Kenneth C.
Heath, Brent L.
Hendrickson, Edw.
Henkel, Wallace
Herrod, Clara
Herset, Sylvan
Hershberger, Linda
Hershberger, Tim
Hewitt, Ethel
Heyne, Mariane
Hill, Alice M.
Hill, Dayton W.
Hill, Roy
Hindley, Dwight E.
Hockly, Gordy
Hodel, Nancy
Hoff, Jeff
Hoffman, Lee Roy
Hoffman, Sheila
Hohnson, Cindy
Holcomb, Amy
Holcomb, Andrea
Holcomb, Mike
Holdbrook, Kim
Holder, Elliott
Holder, Kathy B.
Holder, Mary
Holder, Timothy L.

Holt, Mrs. William O.
Hooper, Ruby
Hoppe, Byron A.
Horning, Michael L.
Howard, Ann
Howard, Dan
Howarth, James H.
Howarth, Lois
Hudson, Stanley H.
Huffman, Debbie
Huffman, Roland J.
Huffman, Shawn
Huisentruit, Maurice
Huntsberger, Kate
Hurd, Frank D.
Hurlbert, Butch
Hutton, Donald J.
Hutton, Donald L.
Iverson, Bernice
Jacobson, Dale
Jantz, Sue
Jaqueth, E. Robert
Jaqueth, F. K.
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Jenkins, Kathleen
Jenkins, Ray H.
Jenkins, Robert W.
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Johnson, Bob
Johnson, Cindy
Johnson, David
Johnson, Dean
Johnson, Dorothy
Johnson, Edna
Johnson, Gerald W.
Johnson, Glen
Johnson, Harold
Johnson, Mary Lee
Johnson, Phyllis J.
Johnson, Richard W.
Johnson, Ronald
Johnson, Ronald I.
Johnson, Tony
Johnson, Wilfred C. Jr.
Johnston, Charli
Johnston, Jill
Johnston, Joseph E.
Jones, Billie Jo
Jordan, Judy
Jorgenson, Joan
Journot, Delores
Journot, William E.
Judkins, Jack
Judkins, Jim
Judkins, Wilma
Jungst, Joann
Kachlen, John
Kair, Brian M.
Kallis, Gordon
Kamena, Robert F.
Katarzy, Walter M
Keeler, Patti
Keeler, R. F.
Kehn, Robert
Keiffer, Kathy
Keller, Clarence L.
Keller, Edwin R.
Keller, Hazel M.
Kelley, L.J.
Kelley, Wendy
Kendall, Elizabeth
Kendall, Janet R.
Kenelty, Gerald G.
Kenelty, Jerry
Kenelty, Marylin J.
Kenelty, Richard H.
Kessel, Bruce
Kessel, Pat
Kienas, Albert
Kilery, Donald A.
Kilgore, Johna
Kilgore, Tom
Kinder, James K.
King, Joel E.
King, Larry
Kinney, Mary O.
Kirby, Bill
Kirschenman, Judy
Kirschenmann, Eugene
Kitch, Todd
Klenda, Raymond A.
Klin, Rick
Kline, Roland V.
Kline, Viola
Knadler, Tamatha
Knickerbocker, Robert L.
Koch, Eugene J.
Koehler, Steve
Kovalenko, Gary
Kovalenko, Marva
Kroll, Carol
Kroll, Mark A.
Kujawa, Gynell D.
Kujawa, Loren R.
Kvapil, Brent
Kvapil, Walter F.
Kyes, Frank
Kyes, Penny
Kyriss, James
Kyriss, Joanne
Laier, April
Lamey, Alan
Lamey, Sherry
Landon, Meron F.
Langley, Ronald S.
Lapka, Todd
Larson, Charles
Larson, Denyce
Larson, Kay N.
Larson, Linda A.
Larson, Mary Lynn
Larson, Phyllis
Larson, Unknown B.
Latham, Carol J.
Latham, David F.
Lauer, Mark
Lausen, Earl
Leckrone, Dean B.
Lehnert, Arnold
Lehnert, Shirley
Lewis, Lloyd A.
Lighty, Rined
Lindley, Dwight E.
Lindsay, Lamar E.
Little, Bruce
Little, William W.
Little, Yvonne R.
Locher, Kasimir
Louden, Fred
Luedecke, Gladys
Luger, John L.
Lundvall, Carrel
Luscher, James
Luscher, Yvonne
Lykins, Frances
Mack, Rick
Madison, David N.
Madison, Steven R.
Managhan, William
Maples, M.L.
Mason, Mary R.
Mason, Walter E.
Master, Christopher
Master, Norman
Masters, Belinda
Masters, Ronald J.
Mauer, D. A.
Mauer, W. G.
Maunus, Kathy
Maurer, Dorothy A.
Maurer, W.G.
Maynard, Jeannie
Maynard, Larry R.
McCann, Micheal D.
McCarty, Dorothy
McCarty, Thomas J.
McCloud, Kathy
McCloud, Marc
McCoy, Francis A.
McCoy, Lorene K.
McCully, Donna
McCully, Vernon M.
McElmurry, Jennifer
McGhee, Robert F.
McGill, Marc O.
McGill, Peggy L.
McKay, Jerry J.
McKay, Jimmie P.
McLaury, R.
McNight, Deborah K.
McNulty, Timothy P.
McQueen, Clifford
McQueen, Donna M.
Mellem, Lydia
Mellem, Vernon
Merkwan, Annette
Merkwan, Mark
Merrick, Rocky
Messick, Earle
Miles, Edith M.
Miles, Jim C.
Miller, Ann
Miller, Jane
Miller, Kelly A.
Miller, Mike
Milton, Donald L.
Mitchell, Donald F.
Mitchell, Louise
Mitchell, Ruby
Mittelstaedt, Tammy
Moe, Lloyd A.
Moe, Peggy M.
Moen, Dale K.
Moen, Michael
Moen, Rena
Mohawk, James
Moles, Ann N.

Moles, Clarence W.
Moles, David W.
Moncur, Colleen
Moncur, Max
Mongan, Larry
Monroe, Dwane
Monroe, Karen
Montana Equipment Repair
Montana Trading Post
Moore, Jay
Morrison, Phil
Morrison, Rayetta I.
Morton, Houston
Morton, Jean & Lee
Muench, Emil B.
Murchie, Michael M.
Murchie, Sally
Murer, Diane
Murer, Jack
Murrdely, Laurence P.
Mysse, Dolores
Mysse, Lydia
Nate, Charles M.
Nearhood, Jerleen
Neisess, Joseph D. Jr.
Nelson, A. E.
Nelson, Barbara
Nelson, Gerald E.
Nelson, Jeanne
Nelson, Jon P.
Nelson, W. Lewis
Ness, Bridgett T.
Ness, Mae U.
Netter-Schatz, Michelle
Newstrom, Steve
Newton, Steve
Nicholls, Alvin R.
Nixon, Gerald E.
Nixon, Worth
Noble, Irwin L.
Noble, Scott N.
Noon, Jay M.
Norberg, John M.
Norton, Dean
Norton, Marilyn
Norvell, Karl
Norvell, Rhea M.
O'Brien, Vicky
O'Neill, Pat
Oedewaldt, Terry & Carol
Oertel, Esther N.
Oikle, Ricky R.
Okonski, Jerry P.
Okonski, Mary A.
Olson, Birdie K.
Olson, Daniel D.
Olson, Donna P.
Olson, Ernie W.
Olson, Randy
Orge, Dianna St.
Orr, Brent H.
Orr, Darrel C.
Orr, Jeannie
Orr, Marion
Orr, Rita M.
Orsborn, Elvira
Owen, Linda
Paige, Bryan
Paliga, George
Paliga, Helen
Palmerton, Margaret
Pamnea, Brett
Pamnea, Valerie
Parker, Erin
Parker, Esther L.
Patton, Judy
Paullin, Donna
Paullin, Howard
Peek, Corianna
Peek, Jerry
Peltier, Wade A.
Pennock, Alfred
Penttila, Herman R
Peppenger, Pam
Peters, Hazel Doris
Peters, Llyde
Peterson Sandra L.
Peterson, Dorothy N.
Peterson, James D.
Peterson, Wayne K.
Pettitt, Paulins
Pettitt, Tom
Pickering, Charles Allen
Pickering, Jane
Pierce, C.E.
Pierce, Sarah E.
Pilny, Charles Jr.
Pilny, Kevin M.
Pilny, Myrna A.
Ponin, Mike
Post, Maurice J.
Powell, Linda L.
Powell, Robert E.
Prather, Nell J.
Preston, Kenneth L.
Priest, Alice
Profitt, Calvin
Profitt, Larry
Profitt, Roberta
Prouse, William E.
Prowse, Robert B.
Purdy, Arthur T.
Purdy, Joanne
Quinn, Christi
Quinn, Dennis G.
Ramsey, Connie L.
Ramsey, Morris G.
Ransier, Lewis
Rasmussen, R.K.
Rate, Charles M.
Rawland, Dorothy
Rawland, Edward
Ray, Thomas K.
Rayome, Judith A.
Rayome, Ronald
Read, Bill
Rebo, Debbie
Reinpold, Vince
Remick, Andrew P.
Remp, Raymond H.
Remp, Ron
Resch, Kerry T.
Rexroad, C.B.
Reynolds, Lorie
Reynolds, Randy
Richards, Larry
Richards, Sharie L.
Riddle, Dan S.
Rieley, Lena
Riley, Charles
Riley, Donald A.
Ringsbye, Janice A.
Robert, Peggy
Roberts, David P.
Roberts, Gary
Roberts, Jim
Roberts, Kevin
Roberts, Suzanne L.
Robertson, Julius
Robertson, May C.
Robertson, Sally
Robinson, Bert
Robinson, E. Mae
Rogers, Evert C.
Rogers, Kim
Roll, Douglas
Roll, Pam
Romine, Kerry
Rooney, Dianna
Rooney, Mick
Rooney, Tim
Rosenquist, Donald F.
Rosenquist, John A.
Roush, Howard A.
Rowe, Terry A.
Rucker, Joel A. Sr.
Ruff, Rhona
Rummel, Bob
Runyan, Cleve
Runyan, Doris I.
Ruple, Joyce
Sagen, Kenneth D.
Sagen, Nancy A.
Sales, Gordon R.
Salo, Deby
Salo, G.
Sand, Andy
Sand, Penny
Sanders, Bob
Sanderson, Bob
Sanderson, Jan
Sarnow, Art
Sasse, Willis A.
Sather, Alfred
Sather, Gladys A.
Sauby, James W.
Sauer, John F.
Sauer, Judith A.
Sausedo, Duane
Sausedo, Milton J.
Savage, Dorothy
Schad, Lois K.
Schauss, Deitman
Schauss, Paula J.
Scheel, Joan L.
Schelvan, Willis
Schnackenberg, Joseph
Schnackenberg, Laura
Schneider, Harry J.
Schneider, Sue
Schroeder, Roger
Schultz, Hans
Schultz, Karen
Schwenk, Denis J.
Scott, Gloria J.
Scott, Jay S.
Scott, L.A.

Scow, Tom
Sederdahl. Raymond F.
Sedgwick, Kevin
Seekins, Sharon
Sellard, Belin K.
Seyth, Clint
Shaffner, Bert
Shaffner, Patricia J.
Shelly, Dennis
Shelmerdine, Stan
Sheridan, Dennis R.
Shind, Jo. M.
Shirley, Will
Sichting, Heidi
Silver Tip Mining (Doug Scow)
Sims, Gary
Skinn, Craig
Skinner, Wes
Slauson, Marie
Slauson, Richard
Sleizer, Aloha
Sleizer, Donald L.
Sleizer, Leonard R.
Slover, Verna
Smith, Rex E.
Smith, Susan
Smith, Susan L.
Smith, Walter S.
Snavely, Cloyd A.
Snerl, Gail Anderson
Snerl, Steve
Snyder, Cory
Snyder, Franklin
Snyder, Jeaninne
Snyder, Jerry W.
Snyder, Miriam B.
Snyder, Rick
Snyder, Ron
Snyder, Shana
Snyder, Steven
Sonju, Steven
Sorensen, Evelyne
Sorensen, Kenneth
Spencer, Barb
Spencer, Dee
Spencer, Kay N.
Spencer, Richard V.
Spencer, Ronald
Spencer, Shelly L.
Spencer, Wm. D.
Spenser, Forrest F.
Sperry, Nora
St. Onge, Diana
Stafford, Thomas J.
Stanley, Robert
Starke, John D.
Stewart, Lana
Stewart, Rich
Stickney, Douglas F.
Stickney, Martha
Stindt, Ada
Stindt, Joy
Stokesberry, William
Stoller, Cathy
Stonehocker, Patti
Strand, David
Stubbs, Betty
Stubbs, Calvin R.
Stubbs, Glen E.
Stubbs, Glenn N.
Stubbs, Linda
Stubbs, Tony
Sullivan, Laurie, L.
Sverdrup, Lawrence
Swanson, Tony
Swenson, Barbara
Swenson, David
Swimley, Kathy
Swimley, Ralph T.
Swimley, Robin C.
Swing, Beverly
Swing, John A.
Switzer, Mike
Syne, Kenneth O.
Tarbert, Ernest
Taylor, Patricia
Taylor, Ralph W.
TBC Timber
Tennison, Kathy
Tennison, Rory
Tholen, Kenneth
Thom, Alba
Thom, Duane
Thom, Tom
Thomas, Ray K.
Thomly, Les H.
Thompson, Bob
Thompson, Donald W.
Thompson, Fred O. Jr.
Thompson, Merry M.
Thompson, Richard W.
Thomson, Beverley N.
Thomson, Darrell M.
Thomson, Don
Thomson, Donald B.
Thomson, Sue
Thoreson, Ethel
Thormby, Jestt
Thorstenson, Steve
Tillotson, Elmer S.
Torgison, Daniel W.
Torgison, Donald
Torgison, Joan
Trimble, Elizabeth P.
Trimble, Hugh C.
Tuffer, ? F.
Twapil, Brent
Underwood, Ardith
Underwood, James A.
Unknown 1,2,3,4,5,6,7
Unknown, Gary
Unknown, Robert W.
Unknown, Scott
Unreadable, Mick
Urdahl, Albert W.
Urdahl, Kay
Urdahl, Lawrence
Urdahl, Marlys
Vasquez, D.F.
Vaughn, Benjamin
Vaughn, Eleanor
Vaughnn, Harriett
Vayette, Penny
Vernon, Michael
Vial, Joan
Vial, Mel
Vickrey, Sandy
Vincent, Bill
Vincent, Corinne
Vincent, Scott
Vincent, Shawna
Vincent, Steven W.
Vincent, Sue
Vincent, Will
Vinson, Brenda
Vinson, Harvey
Vinson, Sheryl
Vogel, Leonard
Volkenand, M.G.
Voorhies, Linda J.
Voorhies, Mike A.
Wagner, Fred
Wagner, Michael C.
Wagner, Reva
Wagner, William
Wakefield, Todd E.
Wald, Albert W.
Waldron, Barbara L.
Waldron, W.L.
Waldron, Wayne C. Jr.
Walker, Don
Wall, A.W.
Watt, William
Way, Charlie L.
Wayland-Smith, Peggy
Webb. Bernard L.
Weber, Jeff
Wegner, Donald
Wegner, Maria L.
Weisbeck, David S.
Weisbeck, Phyllis
Weitzel, Ray
Welch, Charles
Welch, James A.
Weldon, Dorothy
Wells, Earl J.
Westfall, Bonnie B.
Wetherelt, Leonard
Wetherelt, Sharon
White, Ben
White, Myrna J.
White, Victor
Whitehouse, Duane
Whitehouse, Kent
Whitehouse, Mildred
Whitmarsh, Gene A.
Whitmarsh, Shane
Wilburn, Robert
Wilkins, Don
Williams, Dan
Williams, Daryel D.
Williams, Elizabeth
Williams, Glenda K.
Williams, Jaimee
Williams, Lawrence D.
Williams, Paul
Williams, Petra M.
Williams, Teresa M.
Wilson, C.K.
Wilson, Debbie
Wilson, Donald E.
Wilson, Doris A.
Wilson, Ida
Wilson, Rebel
Wilson, Stan
Windom, Dave
Wold, D.T.

Wolleat, Cheryl
Woller, Judy
Woller, Ronald
Wood, Frank
Wood, George
Wood, Joe
Wood, Karen
Wood, Mark F.
Wood, Nancy L.
Wright, George
Wrineger, Wm. L.
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Comments and Responses

The following provides the agencies' responses to substantive public comments on the DEIS and the Supplemental DEIS. The comments have been taken from the letters submitted during the public comment period and from oral comments received during the public meetings on the DEIS and the Supplemental DEIS.

The comments and responses are grouped by resource area. For some resources, such as water quality, comments have been divided further into subgroups to reflect comments on similar topics. Many comments have been grouped if they were similar in in substance. Every attempt was made to present each comment accurately. Each comment is followed by the letter number of the commenter(s) providing the comment. The letter number of each commenter is provided in the preceding section. On many comments, more than one commenter expressed the same comment. In such an instance, several letter numbers follow the comment. References in the agencies' responses to sections, such as *Surface Water Quality*, or to chapters, such as Chapter 4, refer to sections in the FEIS, unless otherwise noted. Since comments were received on both the DEIS and the Supplemental DEIS, the agencies have identified the document (DEIS or SDEIS) where references to page or table numbers are made in the comments. Comments are presented in this smaller size type and the agencies' responses are in this larger size type.

After the comments and responses, letters from federal, state or local agencies, local Indian tribes, and elected officials are reprinted in their entirety. The following letters have been reprinted—

	Letter #
Kootenai Tribe Of Idaho	10
U.S. Geological Survey	35
Montana State Representative Mary Lou Peterson	45
U.S. Environmental Protection Agency	85
Department of Energy, Bonneville Power Administration	101
Kootenai Tribe Of Idaho	121
Montana State Senator Eleanor L. Vaughn	129
Lincoln County Commissioners	135
Confederated Salish & Kootenai Tribes	146
U.S. Department of Transportation	160
U.S. Department of the Interior, Bureau of Mines	169
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Idaho Department of Health and Welfare	192
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U.S. Army Corps of Engineers	225
U.S. Environmental Protection Agency	229
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Noranda's written responses to public comments on the DEIS and SDEIS follow letters from officials.

WATER QUALITY

Petition Issues

1WQ The Montanore Project will violate National Clean Water Policy and Goals, fails to satisfy the requirements of the Montana Water Quality Act, and will violate Montana's Environmental Policies and Goals. (1, 2, 3, 85, 144)

The US Constitution and Montana's Constitution and other pieces of legislation direct the state and each person to "maintain and improve a clean and healthful environment" for present and future generations. The legislature clearly intended to make protection of the environment from degradation a top priority. The legislature appears to have adopted the position that no human activity that degrades the environment or otherwise upsets the sustainable harmony which exists between people and their environment should be allowed to occur, regardless of any short-term economic benefits that may be associated with the enterprise. Because the Montanore Project would degrade the quality of Montana waters, the state is therefore obligated to prohibit the project from being developed as currently planned. (3, 85, 86, 144)

Response: Montana has passed the Montana Water Quality Act to protect the waters of the State of Montana. The Board of Health and Environmental Sciences subsequently adopted rules implementing the Montana Water Quality Act, which are administered by the Department of Health and Environmental Sciences. The EPA subsequently delegated responsibility for implementing the federal Clean Water Act (40 CFR 131.20 et seq.) to the State of Montana. Montana's non-degradation policy is set forth in the Montana Water Quality Act—

> The board shall require: (1) that any state waters whose existing quality is higher than the established water quality standards be maintained at that high quality unless it has been affirmatively demonstrated to the board that a change is justified as a result of necessary economic or social development and will not preclude present and anticipated uses... and (2) any ...project...which would constitute a new source of pollution...to high quality waters...provide the degree of waste treatment necessary to maintain that existing high water quality" (§ 75-5-303, MCA).

The Board of Health and Environmental Sciences has adopted nondegradation rules administered by the department. The non-degradation rules are set forth in ARM 16.20.1011 for ground water and ARM 16.20.701 et seq. for surface water.

A subsequent comment and response also discusses short-term economic benefits.

2WQ The document, like the earlier draft, ignores the appropriate subsection in the nondegradation policy established in MCA 75-5-303. *To provide the degree of waste treatment necessary to maintain that existing high water quality.* (130, 227)

Since Noranda's Montanore Project will constitute a new source of pollution to the high quality waters of Libby Creek the Board "shall require" Noranda to provide the degree of waste treatment necessary to maintain the existing high water quality in Libby Creek and its tributaries. (1, 3, 144)

Section 75-5-303(1) appears to contain a loophole in the nondegradation policy. The legislative intent behind the Water Quality Act is to "preserve, protect and improve" state waters. In order to comply with this intent, the apparent loophole in section 303(1) must be very narrowly construed. Noranda's Petition fails to satisfy the exception to the Nondegradation Policy. Must meet three conditions: See Section 75-5-303(1). (1, 3, 152)

None of the alternatives address prevention of groundwater pollution. (123)

Response: Noranda has petitioned the Board of Health and Environmental Sciences through the Department of Health and Environmental Sciences to change the quality of surface and ground waters. The Board has determined that the petition, in conjunction with the EIS and public hearing to be held on the petition, will satisfy the requirements of the nondegradation rules.

The DHES' current interpretation of § 75-5-303 is that some degree of treatment and "best management practices" are required before degradation can be considered. This is consistent with EPA guidance.

Montana surface water quality standards require that industrial wastes receive, as a minimum, treatment equivalent to best practicable control technology currently available (BPCTCA), or the equivalent of secondary treatment (ARM 16.20.631) as determined by the DHES. Montana BPCTCA incorporates by reference federal treatment standards as defined in 40 CFR Subchapter N which specifies effluent limitation for mining and milling discharges and, in cases where BPCTCA is not defined by EPA, industrial wastes must receive a minimum of secondary treatment or equivalent as determined by the DHES.

The BPCTCA for removal of sediments and associated metals has been defined for mining and milling operations. Those treatments are not effective for removal of nitrogen, however, and because nitrogen is a nutrient which has the potential to cause undesirable aquatic growths in surface waters, the DHES is required pursuant to ARM 16.20.631 to make a determination regarding what constitutes secondary treatment or equivalent for nitrogen removal. The DHES has not made this determination. Technologies which may be considered secondary treatment include reverse osmosis, ion exchange, properly designed land application or treatment, evaporation or combination of one or more of these or other technologies. (Other technologies may exists which could also be considered secondary treatment for nitrogen. These technologies, however, have not been evaluated by the DHES).

The Board of Health and Environmental Sciences will determine if and to what degree degradation may be allowed. Although some degradation may be allowed, granting some degradation would not change the established surface water quality standards or change the classification of Libby Creek or any tributaries. The Board will consider the petition, and comments on the petition and the EIS, in its hearing process. Chapter 1 provides a discussion of the procedures used by the Board of Health and Environmental Sciences in considering Noranda's petition.

Noranda has proposed land application of excess water. Noranda also has proposed best management practices to control erosion and sedimentation (Appendix G). Alternative 3 has been revised to include three water treatment and management options. Alternative 3A would require full lining of the tailings impoundment and mechanical treatment of all excess water before, during and after operations. The agencies preferred Alternative 3C includes land application treatment of excess water.

3WQ Noranda's Petition to lower water quality standards is prohibited by section 75-5-302. This section prohibits the Board from lowering any water quality standard or classification unless it finds that the water was originally incorrectly classified. Noranda's Petition offers no basis for determining that these waters were incorrectly classified. On the contrary, Noranda's Petition establishes the opposite. (1, 29)

Response: Noranda's petition to the Board is to change the quality of surface and ground waters. As discussed in the previous comment, such a change is allowed under certain conditions. If approved, Noranda's request would not change the classification of Libby Creek. Section 75-5-302, MCA referred to in this comment addresses the reclassification of surface waters and is not relevant to Noranda's petition.

4WQ The Board should not be too hasty to conclude that the Montanore Project itself is a necessary or even justifiable means of curing the area's economic or social hardships. Imperative that Noranda demonstrate that the proposed degradation of ambient waters is necessary and a detailed statement of economic or social need, a description of alternatives that would meet the economic or social need but would not require water quality degradation and an analysis showing the public would be better off with the development and lower quality water. (3)

Noranda must establish proof that the degradation of high quality water is justified for economic or social reasons. Noranda Petition fails to provide sufficient data to support this demonstration. (1, 3, 126)

Even if subsection (1) of the nondegradation policy was appropriate, as the agencies incorrectly maintain, the draft EIS does not meet the requirements for it established in the nondegradation rules (ARM 16.20.701). Neither Noranda nor the agencies have met the burden of proof to demonstrate that beneficial uses will not be harmed by allowing the proposed changes in water quality, or that it is justifiable for "necessary economic or social development." The document includes no economic or technical information to demonstrate Noranda has responded to rules ARM 16.20.704 (e), (i), (k), (l), (m), (n), it is impossible to determine with any certainty from the information provided as to whether the long term degradation in the Libby Creek watershed is an acceptable tradeoff for the short term economic benefits of the mining. The public can not determine from this document whether the economic benefits could still be provided without allowing the requested changes in ambient water quality. (130, 227, 239)

Response: The EIS documents the agencies' analysis of the effects of approving all portions of Noranda's proposal, including its petition before the Board of Health and Environmental Sciences. The EIS discusses Noranda's requested change in water quality under Alternative 1 in Chapter 2, water quality effects in Chapter 4 under *Surface Water Quality* and *Ground Water Hydrology*, and the economic effects of the project in Chapter 4—*Socioeconomics*. Reasonable alternatives that may result in less change in water quality are discussed under Alternatives 2 and 3. Alternative 3 has been revised from that presented in the Supplemental DEIS to disclose the environmental effects of lining the impoundment and treating all excess water prior to discharge or disposal. Other potential developments that may provide economic and social benefits for the area are beyond the scope of the EIS.

The rules in ARM 16.20.704 are not absolute requirements for petitions, but are subject to the discretion of the Department of Health and Environmental Sciences. The rules in ARM 16.20.704 discuss what information may be needed in a petition; these rules do not establish EIS content. Noranda's analysis of the economic and social need for the project is discussed in the petition and the supplemental petition information. The economic or social need for the project will be considered by the Board prior to issuing a decision. The purpose of the Montanore Project EIS is to document the agencies' analysis of a proposed action—construction and operation of the Montanore Project—and reasonable alternatives to the proposed action. The EIS does not evaluate Noranda's petition, only the environmental effects of granting or denying the petition.

5WQ Noranda must demonstrate by conclusive proof that a degradation of higher water quality will not preclude present or future uses. Section 75-5-303(1) of the Water Quality Act places this burden on Noranda.

Noranda's Petition clearly fails to satisfy this requirement. Therefore the Board should deny their petition. (1, 3, 86)

Response: Chapters 1 and 4 discuss the conditions under which the Board of Health and Environmental Sciences can allow changes in water quality (see previous comment). As discussed in the *Surface Water Quality* section of Chapter 4, projected concentrations under Alternatives 1 and 2 would violate standards designed to protect beneficial uses. Water quality standards would be met under the agencies' preferred Alternative 3. Under Alternative 3C, total nitrogen concentrations might exceed 1 mg/L. Additional monitoring would be implemented to ensure beneficial uses are protected.

6WQ According to the nondegradation rules, presuming the law does allow Noranda to degrade, the burden of proof is on Noranda to prove that their requested "change in ambient concentrations" will not adversely affect beneficial uses. If standards will be violated, the most conservative measure of whether beneficial uses are harmed, then their petition must be rejected. The document should say this clearly. (227)

A finding that no significant impacts to beneficial uses should be made based on this analysis. (139)

The effect of granting Noranda's petition on surface water quality is discussed under *Alternative 1* in the *Surface Water Quality* section of Chapter 4. The agencies compare projected water quality with standards designed to protect beneficial uses. The agencies recognize the uncertainty over whether the standards designed to protect the beneficial use of aquatic life would be affected by increased metals and nitrate concentrations. This uncertainty is discussed in detail in Chapter 4, *Surface Water Quality*, and *Fish and Other Aquatic Life* sections. The Board of Health and Environmental Sciences will make a finding concerning the protection of beneficial uses.

7WQ The range of alternatives considered was inadequate. An alternative that requires the mining operations to be conducted in a manner that would not result in degradation of the surface or ground water should have been included and must be included in the FEIS. A non-degradation water quality alternative must include: (1) complete explanation of the operating procedures that would be required to avoid water quality degradation; (2) thorough consideration of the costs in relation to the profits that the mining companies expect to realize. Without taking account of the expected profits, there is no adequate basis for evaluating whether or not the companies may reasonably be require to bear the increased costs of such an alternative. (249)

There is no financial data on the proposed Montanore mineral development. While this information may be considered proprietary information, we believe that once Noranda has petitioned the Board of Health for water quality exemptions that will involve degrading a public resource this proprietary protection is waived. (147)

Have you reviewed Noranda's cost and income projections as a basis for your dismissal? If so, where is the information in the Draft or Supplemental Draft? If you have not reviewed financial data, why not? Recall that Noranda bears the risk in this--they must persuade you, not the other way around (40 CFR 124.85). (239)

The project may prevent future growth and development in the area, irreversibly deplete valuable resources, and create more severe long-term economic hardship by triggering an influx of new people into the community, encouraging them to be dependant upon an unsustainable form of development, and thereby foregoing opportunities to develop more sustainable means of subsistence. In addressing the economic and social need of the project, these non-water costs must be taken into consideration. (3, 29, 89, 136)

Alternatives selection should have included an alternative with one objective of nondegradation of ground and surface waters. (130)

Response: Reasonable alternatives that may result in fewer effects on water quality are discussed under Alternatives 2 and 3. Alternative 3 has been revised from that presented in the

Supplemental DEIS to disclose the environmental effects of lining the impoundment and treating all excess water prior to discharge or disposal. These operating procedures would reduce the effects on water quality to a minimum. The costs associated with water treatment are discussed in Chapter 2. The agencies' analysis of Alternative 7, no action, discloses the effects of an alternative that would result in no degradation. The Board of Health and Environmental Sciences may request additional information or analysis during the hearing process.

The agencies did not consider costs in relation to expected profits. Profits are not possible to predict accurately because they depend on many factors. Some factors, such as rate of return on invested capital, vary with individual companies and current economic conditions. Other factors, such as metal prices, fluctuate and are not predictable.

8WQ Several possibilities for alternatives exist in the Libby area. The W.R. Grace mine is an example of right livelihood. Another possibility would be a wood waste alcohol. Solar-conservation could be implemented to provide a better energy resource and provide 17,000 direct jobs in the Pacific Northwest (10 direct and 20 indirect in Libby). Homesteading could be another way to develop employment and add to the economic base. (58)

Response: Reasonable alternatives that would result in less effects to surface and ground water quality are presented as part of Alternatives 2 and 3. Chapter 2, Alternative 3, provides information on three water treatment systems, their potential effectiveness, and costs. Evaluation of economic development alternatives is outside the scope of the EIS for this project.

9WQ Do the water degradation standards apply only to mining? (188)

Response: The non-degradation rules (16.20.702) apply "to any activity of man which would cause a new or increased source of pollution to state waters."

10WQ Degradation of private water resources is a violation of the law. The agencies cannot approve the Project as proposed if it will pollute these private resources. This problem could probably be avoided if Percolation Pond Site No. 2 were relocated and/or if all excess water were treated prior to discharge. (201)

Response: With the exception of "national resource waters," some change in quality of ground and surface water resources is allowed under Montana law (see previous comments). The Board of Health and Environmental Sciences will consider existing and reasonably foreseeable beneficial uses of ground water prior to issuing a decision on Noranda's petition. Under the rules governing water quality, a "mixing zone" is allowed; mixing zone is defined in Rule 16.20.603 (12). The mixing zone for ground water is the permit area. The *Ground Water Hydrology* section of Chapter 4 has been revised to include a discussion of effects on ground water and applicable mixing zones. The agencies analysis indicates that projected concentrations of nitrates and manganese would be higher than ambient concentrations. Relocation of a land application disposal area probably would not avoid water quality changes, but merely would relocate the changes. Alternative 3 (Options A and B) includes mechanical treatment of some or all excess water prior to discharge. Alternative 3C includes the seasonal discharge of excess water at additional land application disposal areas.

11WQ It is hard to tell that analysis for a nondegradation petition is included in this document. Most of the discussion centers on compliance with standards and not degradation. There is no table in the supplement indicating the specific water quality criteria Noranda is requesting in its petition. (227)

Response: Chapter 2 has been revised to include a discussion of Noranda's petition and Noranda's requested changes in water quality. Alternatives 2 and 3 were developed in response to the issue of reducing changes in surface or ground water quality. The section in Chapter 4 entitled *Uncertainty Associated with the Water Quality Assessment* discusses the uncertainty associated with the the agencies' analysis. In the *Surface Water Quality* section of Chapter 4, tables are presented comparing water quality standards, existing water quality, and projected water quality. The associated text includes a discussion of the agencies' analysis on whether existing water quality would be degraded.

12WQ I believe this entire EIS process is premature and unrealistic because not enough is presently known about the geology and hydrology of the project area to fully anticipate environmental impacts of project activities. (128, 130)

The document is based on little more than a year's collection of data from Noranda's consultant. (130)

The document admits too much uncertainty, especially regarding water quality, for it to comply with NEPA and MEPA, which require environmental documents to detail short-and long term impacts and irretrievable commitments of resources. This document still leaves the public guessing on basic but critical questions such as will acid mine drainage occur, will water quality standards be violated and can the population of the northern beechfern be not just protected but enhanced, as is supposed to be the case with sensitive plant species? (227)

Response: The agencies acknowledge that the information on the geology and hydrology of the mine area is based on a limited number of drill holes. Additional information on the geologic, hydrologic, and geotechnical characteristics of the orebody would be collected following completion of the Libby Creek adit. Because of the nature of sampling, some uncertainty will always exist when using drilling information to characterize ore, waste rock, and overburden.

Noranda also has conducted interim monitoring since the baseline year (see Chapter 2). This additional information was used in the agencies' analysis.

Additional information and analysis relative to acid mine drainage, adit and mine water quality and quantity, and subsidence is included in the FEIS. The agencies' discussion of the uncertainty associated with subsidence, acid mine drainage, and water quality is disclosed in Chapter 4. Agencies' conservation plan for the northern beechfern has been revised under Alternative 2 in Chapter 2.

Irretrievable and irreversible commitments of resources are disclosed under each resource area under the heading *Resource Commitments*.

13WQ The SDEIS incompletely states Noranda needs a waiver to exceed ambient conditions for nitrate and ammonia. Noranda also would need a waiver for other constituents for which there are standards such as metals. (227)

Response: The agencies' analysis of water treatment alternatives (Alternative 3) did not indicate that an authorization allowing a change in ambient water quality would be needed for constituents other than nitrates and ammonia. Impacts associated with Alternative 3 have been revised in Chapter 4 to reflect this uncertainty. Concentrations of other constituents not analyzed by the agencies, such as sulfate and sodium, also may exceed ambient concentrations. The discussion of water treatment alternatives in Chapter 2 has been revised to indicate that additional testing and analysis would be needed prior to final system selection. The additional testing and analysis would assist in determining whether an authorization allowing a change in ambient water quality for constituents other than nitrates and ammonia would be needed.

14WQ Noranda's Proposal for mine water disposal fails to address long term pollution control requirements. (1)

Response: All disposal of excess mine water would be required to comply with Montana Water Quality and the Montana Metal Mine Reclamation acts and regulations. These laws and regulations require protection of beneficial uses of water resources. Post-operational monitoring is described in Chapter 2. Anticipated impacts following operations is discussed extensively in Chapter 4.

15WQ Noranda disagrees with the DEIS interpretation of the Montana non-degradation policy in the use of the Gold Book aquatic life criteria and secondary drinking water standards as standards for determination of non-degradation. The EPA clearly states in the Gold Book that the criteria are intended as guidelines and not standards. (139)

Response: The Board of Health and Environmental Sciences has formally adopted through rule-making the Gold Book aquatic life criteria and secondary drinking water standards as state water quality standards for ambient water (ARM §16.20.203).

16WQ Noranda's Analysis is based on faulty data. Noranda's analysis of groundwater quality is based on data from a single monitoring well LCTM-008. Appendix C states, "No valid sample data was found for this site." At a minimum, the Board should require clarification from Noranda as to wether the data in Table 3-2 and well LCTM-008 is invalid, and if so, why they have sought to induce the Board to lower water quality standards on the basis of false data. (1)

Response: This comment refers to Noranda's Petition for Change in Quality of Ambient Water submitted to the state Water Quality Bureau. It is not clear what is indicated by the footnote "No valid sample data was found for this site." The sampling event data sheets included in Appendix J, Volume 4 of the Mine Permit Application do not indicate that the water quality data for LCTM-008 are invalid. The agencies' analysis presented in the FEIS was conducted independently of the analysis contained in Noranda's petition.

17WQ There must be some flexibility built into the laws and the procedures that provide allowances for objective standards when substances introduced into our waters within acceptable levels provide enhancement of the life cycle in the strict definition on paper. There should be a reasonable and timely solution to this problem. (232)

The present non-degradation policies of the State need to be revised to allow for certain levels of nitrates to be discharged into Libby Creek. (228)

No adverse environmental impact from the nitrate levels currently leached into Libby Creek from Noranda's drilling. It is irresponsible to our community to enforce stoppage of the project based on what is essentially a technicality. It is critically important to resolve this issue A.S.A.P. Variance must be granted. (198)

A variance in water quality is in order. Nitrates may have beneficial aspects in Libby Creek as long as they are not excess. (252, 254)

Current water quality concerns have halted the project and these strict interpretations of the law need to be addressed. The project should be held up if the water quality on Libby Creek is not damaged and in fact changed for the better. Let's help our community and get this Montanore Project on line without further delays. (185, 186, 198, 197, 196, 193, 260)

The standards are beyond what we the people of Libby need to protect our environment safely. (183, 184, 185, 221, 231)

Response: The Board of Health and Environmental Sciences can allow some degradation under certain conditions. Under no conditions, however, can the Board allow changes in water quality that would preclude present beneficial uses. Water quality standards have been established by the State of Montana to protect beneficial uses, such as drinking water, agricultural uses and aquatic life. Elevated nitrate concentrations can have adverse effects on aquatic life (see *Fish and Other Aquatic Life* section of Chapter 4).

18WQ Is it possible a waiver could be issued to allow for continued operation while working on a solution for the problem of discharge into Libby Creek rather than halt progress completely? (193, 224, 228, 260)

Response: Noranda could submit a petition to the Board of Health and Environmental Sciences requesting an authorization allowing a change in ambient water quality as part of its Libby Creek adit activities. It has not submitted a petition for its activities specifically associated with the Libby Creek adit. The petition Noranda submitted to the Board in conjunction with its operating permit application would cover discharges from the Libby Creek adit during construction and operation.

Impact Assessment—Water Quality Standards

19WQ Noranda's own water quality data demonstrates that levels of cadmium, chromium, lead, manganese, mercury and silver will exceed state standards after dilution of groundwater effluent with stream flow. Clearly Noranda's own data do not support its Petition. Noranda's estimates show that water quality standards will not be met. Noranda own data demonstrate that its request to lower water quality limits is prohibited by sections 75-5-302 and 303 of the Montana WQA. For these reasons and those set out above the Board must deny Noranda's Petition. (1, 3, 29, 89)

The Montanore Project, by infusing Montana waters with cadmium, lead and other contaminants, clearly creates the potential for imposing severe health costs on present and future residents of Lincoln County. (3, 170)

Concerned with impact that will occur to the water drainage in the proposed project area. Leaves no question that a very significant negative impact to the water quality will occur. (32, 123, 170)

Contrary to what Noranda asserts, the Montanore Project may actually degrade the water to levels below the applicable water quality standards. Concentrations of contaminants entering the water system will, in reality, be higher than estimated by Noranda. (3)

The EPA remains very concerned over the basic issue that water quality standards are likely to be violated under the preferred alternative/alternatives. (229)

EIS doesn't tell what the effect of that violation is expected to be on the environment, and whether or not the effects are irreversible, or if they may, or may not be acceptable. What is the level of risk? If the affects are negligible and of short duration, we believe they may be acceptable and that the water treatment proposed in Alternative 1 is adequate. (100, 112, 131, 151)

The Forest Service needs to identify the specific means by which water quality standards will be maintained. These commitments, which will be necessary in the Mine Operating Plan, need to be fully documented in the supplemental NEPA document. (85)

The agencies should again emphasize that the exceedances forecast in the loading analyses are the result of using detection limit values for As, Cr, Cd, Pb, Hg, Ag, and Zn. The statement that exceedances would occur is not correct. Exceedances could occur, but with the below detection limit data there is no way to determine if they would occur. (258)

Response: Noranda's petition has been revised to reflect the management of excess water and the impact assessment discussed in Chapter 4. Under state law, the Montanore Project cannot affect present or reasonably anticipated beneficial water uses, and the Board cannot allow changes that would exceed water quality standards designed to protect beneficial uses, regardless of the duration. The agencies' analysis projects that surface water quality standards for fish and aquatic life for some metals may be exceeded; these projected exceedances, however, are a function of the analytical detection limits and the assumptions used in the analysis. The assumptions used by the agencies are reasonable, conservative, and protective of water quality. The uncertainty associated with the agencies' analysis is discussed in detail in the *Surface Water Quality* section of Chapter 4. The agencies' analysis indicates that surface water standards for other beneficial uses, such as drinking water or irrigation, would not be exceeded under the agencies' preferred Alternative 3C. Increased health costs to the residents of Lincoln County are not expected (see discussion of *Beneficial Use* in the *Surface Water Quality* section of Chapter 4).

An extensive hydrological and biological monitoring program would be required during operations. Water quality analyses would include a full suite of metals (Appendix B). The results of these monitoring programs would be used to verify the projected changes in water quality, and to ensure that beneficial uses are protected. If the monitoring program identifies a change in water quality which adversely affects beneficial uses, additional mitigation would be used to manage surface water quality.

20WQ The statement [in the SDEIS] ".. whether water quality standards would be exceeded." This statement should say that the use of detection limit values for constituents where the standard and the in-stream values are below the detection limit, the use of instantaneous discharge times for land application, the assumptions regarding zero attenuation in the soils, and assumptions regarding the volumes of water discharged are all conservative assumptions, and the use of all of these assumptions makes it difficult to quantify the changes to in-stream water quality. (258)

Response: The FEIS and these Responses indicate that the agencies' assumptions in the loading analysis are reasonable, conservative, and protective of water quality. The uncertainty associated with the agencies' analysis and the difficulty in quantifying changes to water quality are discussed in detail in the *Surface Water Quality* section of Chapter 4. The assumptions used in the agencies' analysis are discussed in Chapter 6.

21WQ The mitigating measures are excessive and unreasonable. Noranda should be granted variance to allow for the possible and irregular excessive discharge of Cu and Mn during years 2 and 3 of construction. They should be required to maintain existing water quality standards during operation, even to 16 years. (38)

The violation of standards during the 3-year period prior to mill start-up is unacceptable. (13, 102)

The excessive Cu and Mn in surface waters postulated during years 2 & 3 of construction (and possibly year 16 of operation) is only speculative and is the worst case scenario. It won't be for a continuous period, but only for the lowest flow conditions. The long term impacts of exceeding the standards during short periods of two years are minimal. (38)

Due to the extremely limited extent of pre-production workings, it is incorrect to predict an exceedance of the copper and manganese criteria for Libby Creek during the period immediately preceding production start-up and the FEIS should reflect these revised concentrations. Applying the Troy mine water quality values to pre-production workings inflow may be an unduly harsh "worst case" approach. (139)

Response: The section on *Surface Water Quality* (Chapter 4) has been revised from that presented in the DEIS to reflect Noranda's revised plan to manage excess water, and additional information on expected quality of adit, mine and tailings water. The revised analysis was included in the Supplemental DEIS in the *Surface Water Quality* section and subject to public review and comment. Projected copper and manganese concentrations no longer exceed surface water quality standards. The Board of Health and Environmental Sciences can not allow any violation of surface water quality standards. Additional revision to the *Surface Water Quality* section in the FEIS reflects additional information collected during the monitoring of the Libby Creek adit, such as expected nitrate concentrations, and changes in aquatic life.

22WQ The loading analysis and effects of adit/mine discharge on ground and surface water quality would be more complete and better understood if the document included an accounting of the effects of the discharge that has occurred for almost two years at the Libby Creek adit. (227)

Response: Chapter 4 (*Surface Water Quality*, *Ground Water Hydrology*, and *Fish and Other Aquatic Life* sections) has been revised to include a discussion of effects of Libby Creek adit discharges on ground and surface water quality as well as on fish and other aquatic life.

23WQ The SDEIS states (page. 167) "This loading analysis, which is based upon the operations scenarios discussed previously, represents neither a 'best case' nor a 'worst case' analysis." The analysis should represent the 'most likely case' scenario, and the figures used do not do this. (248)

Response: The agencies used a conservative approach in estimating surface water quality impacts. The agencies' analysis represents neither a best case nor a worst case analysis, but a reasonable case upon which to analyze and document impacts. The agencies acknowledge the uncertainty with the analysis; this uncertainty is discussed in detail in the *Surface Water Quality* section of Chapter 4.

24WQ How Montana can legislate a surface water quality standard such as that for arsenic, chromium, lead, mercury, and silver below the detection limit for these metals. It seems that you could be in violation of this law, but the state couldn't catch you because they would not be able to detect the violation. This seems to be another case of an absurd law. Can you comment on this? (34, 227)

Response: Montana water quality standards are based upon EPA standards and criteria established to protect public health and aquatic life. With the exception of standards for arsenic, iron and manganese, standards with the lowest concentrations are designed to protect aquatic life (see Table 4-22 in the *Surface Water Quality* section of Chapter 4). The standards for some metals, such as cadmium and silver, depend on the hardness of the water. Since the hardness in Libby Creek and tributaries is very low, the standards for these metals are lower than for streams with higher hardness.

Under ideal conditions and using special equipment, concentrations of most metals at or below standards can be detected. In several cases, analytical detection limits used by Noranda for water samples exceeded surface water quality criteria. As discussed in Chapter 2, Noranda would use lower detection limits for certain metals during operational monitoring. For some metals, however, it is not possible to predict or to measure compliance with standards using approved analytical methods; other methods must be used to predict impacts and to assure compliance. The agencies' proposed biological monitoring plan (Appendix B) is designed to detect adverse changes to the beneficial uses of aquatic life. Changes in water quality that may affect other beneficial uses would be measurable.

25WQ The statement "for some metals, the standard is below detection limit." is not correct. The standard is based on environmental effect, and it does not matter whether or not the effect value is below the analytical detection limit. (85)

Response: The *Surface Water Quality* section in Chapter 4 has been revised to reflect the relationship between detection limits and water quality standards.

26WQ The incorrect assumption appears to be carried over into the modeling of expected water quality impacts. In Table 4-18 [in the DEIS], the projected water quality for arsenic, lead, mercury and silver is listed as below detection rather than a specific projected water quality concentration. It is difficult to determine whether or not discharges from the mine will violate water quality standards, the modeling should predict an instream concentration that will be compared to the standard and not the detection limit. (85)

Response: The revised section entitled *Uncertainties Associated with the Water Quality Assessment* in Chapter 4 discusses the projected concentrations of metals and the relationship of the detection levels and the agencies' projections.

27WQ The agencies need to apply the EPA criteria that will be in effect during the operation of the mine, not those of current levels as they are being revised. (126, 227)

Response: Water quality standards do change and Noranda would be subject to standards approved by the Board of Health and Environmental Sciences. The standards presented in the *Surface Water Quality* section are those approved by the Board and the EPA.

28WQ The SDEIS states that "low flows are defined in the Montana water quality regulations." Where? (91, 227)

Response: The text in Chapter 2 has been revised to indicate that withdrawals during average annual low flows would be prohibited.

29WQ Urge adoption of Alternative 3. Contamination during low water times is of special concern because of the migratory use of the streams by some species of fish during that time of year. (41)

Response: The agencies' analysis of projected water quality is based on expected flow during low flow periods. The Board of Health and Environmental Sciences cannot approve changes in water quality that would preclude beneficial uses, such as aquatic life, during low flow periods.

30WQ The document states that excess water will be disposed of in 3 ponds and again no mention is made that the water will find it's way to Libby Creek and add to existing problem. (42)

Response: The loading analysis used to project water quality changes as a result of the proposed operations assumes that seepage from the land application disposal areas instantaneously discharges to Libby Creek above station LB 1000 or RA 600.

31WQ The tables on water quality on pages 188 and 189 [in the DEIS] appear to be wild guesses. Perhaps Montanore is not a mine, but a water purification system. No water stays as clean after mining as it was before man messed it up. (31)

Response: The basis for the water quality information presented on Tables 4-11 through 4-14 of the DEIS is discussed in Chapter 6. The water quality impact assessment has been revised to reflect changes in expected water quality, and a change in Noranda's proposed management of excess water.

The projected water quality changes do not indicate that lead sulfides from the barren zone would effect water quality. As discussed in Chapter 2, most of the waste rock from the barren zone would be disposed in previously mined areas of the underground workings. The operational hydrologic monitoring program (Appendix B) includes analysis for lead concentrations in surface and ground water. Under Alternatives 2 and 3, Noranda is required to conduct additional studies of mine water inflow to project post-operational mine water discharge rates and quality. Based upon this information, post-operational mine water treatment may be required (see *Ground Water Hydrology* section of Chapter 4).

The surface water standards identified in the *Surface Water Quality* section are the regulatory surface water standards for the state of Montana. They are included in the tables to facilitate comparison of the projected water quality with regulatory standards. The anticipated mine water quality is presented in Table 4-10.

32WQ What are the short or long term effects if seepage flows into surrounding water on humans, plants or animals who drink the water? (13, 120)

Response: The Board of Health and Environmental Sciences cannot approve changes in water quality that would preclude beneficial uses, such as aquatic life, drinking water, or livestock watering, during low flow periods. Ground water and the water emerging as springs and seeps in the tailings pond area would be similar to the expected tailings pond water quality (Table 4-10). This water would be unsuitable for use as a potable water supply. Surface water quality changes in Libby Creek as a result of tailings seepage are presented in Table 4-18. Tailings water is expected to improve over time. Surface water quality standards would not be exceeded by seepage from the tailings pond under the operating conditions discussed in the FEIS. Noranda would maintain the pressure relief seepage interception system until surface water quality standards can be met without the system. Expected tailings water would be suitable for livestock (Table 4-22).

33WQ Too few analyses of Troy tailings effluent used to predict Noranda's effluent. (37)

Response: The water quality analysis was revised in the SDEIS to reflect additional information collected on water quality from the Troy operation. The analysis has been brought forward into the FEIS.

34WQ There is too much lead in the silver ore. Where is the lead going during mining and milling? What about arsenic? Is Montanore a lead mine also? Are you going to be responsible for lead poisoned water in the Kootenai drainage? (213)

Response: The proposed Montanore Project would not be a lead mine. As discussed in the *Geology and Geotechnical* section of Chapter 3, there is a low grade lead zone near the copper-silver ore to be mined. The lead zone would not be mined. Any lead or arsenic in the ore would be ground and disposed as tailings. The *Surface Water Quality* section of Chapter 4 documents expected lead and arsenic concentrations in excess waters, and the effects of these metals on surface water quality. The lead in the waste rock from the barren zone would be stored underground.

35WQ Not enough attention has been given to the lead - Zinc content of the waste rock. (10)

It is not clear whether the "barren zone" will be mined also. It contains an amount of lead that is truly poisonous, along with Cr and Zn and probably quite a bit of arsenic. How are they going to separate the Pb before it gets into the primary crusher and finally ends up in the tailings. Is there a process for recovery of the Pb planned? Have you noted that the barren zone might be a lean lead mine? All sulfide ores, when exposed to air, start to breakdown rapidly into poison soup. (31)

Response: The "barren zone" or lead zone between the two ore zones would not be mined, and therefore not report to the primary crusher. The lead concentrations found in the barren zone are too low to be economic to mine under present or anticipated market prices. Some minor amounts of lead would be contained in the ore, nearly all of which would go into the concentrate. A very small amount of lead would be contained in the tailings. Most of the waste rock from the barren zone would be disposed in previously mined underground workings. Noranda, however, has proposed to use a small amount (2,500 tons) of waste rock in construction of the tailings impoundment dams. The generation of acid mine drainage and release of toxic metals is indeed a concern with sulfide mineralization. Therefore, one of the mitigations proposed in Alternative 2 would prohibit the use of acid generating materials to construct the tailings impoundment dams.

36WQ The Montana groundwater quality standard for copper is 1.0 mg/1. Therefore, these calculations indicate that no violation of Montana's groundwater quality standard would result from the disposal of excess waters generated by Noranda's proposed development. (139)

Response: Montana has no primary ground water quality standard for copper (Table 4-13). Montana's primary ground water standards are equivalent to the primary drinking water standards established by the EPA.

37WQ; Information related to water quality impacts in this document and the earlier draft is so scattered, incomplete and unorganized that it makes understanding the issue of nondegradation an exercise in extreme patience. The issue is simply too critical and too complex for the public to understand to have it dovetailed in the larger mine EIS. (227)

Response: The agencies acknowledge that the assessment of surface water quality impacts is complex and may require extreme patience to understand. To provide a focussed and coherent discussion on surface water quality, the agencies separated effects to surface water quality from other aspects of surface water hydrology. Expected effects to surface water quality are now contained in a section entitled *Surface Water Quality* in Chapter 4. Effects to ground water are discussed under *Ground Water Hydrology*. The uncertainty associated with agencies' analysis of surface water quality impacts is discussed in detail under *Uncertainties Associated with the Water Quality Assessment* in the *Surface Water Quality* section of Chapter 4)

Impact Assessment—Geochemical Attenuation

38WQ The EPA examined Table 6-11 (R) [in the SDEIS] and finds that total recoverable values exceed existing State standards for several parameters for at least one of the three sample periods. The EPA suggests that total recoverable may indeed be the proper value since there is no surety of soil filtration capacity over the long run and existing instream data show violation of stream standards in Libby Creek. (229)

The discussion on the relative values of using dissolved v. total concentrations as criteria glosses over how the percolation ponds will function. Just analyzing for dissolved fractions will not include all the potentially bio-available metals in the effluent. Moreover, because the effluent will be percolating through organically-poor gravels, attenuation of metals and nitrates will be minimal if not nonexistent. The claim that loading projections "did not assume attenuation" and therefore they are "conservative" and "protective of water quality" is a bit misleading. This approach is not conservative, it is realistic. For physical and biological reasons attenuation in and below the ponds should not be assumed. (227)

Calculations of discharge concentrations should be based on total recoverable metals. EPA recommends that ambient metals levels, at least in surface water, be identified and monitored using total recoverable analytical techniques. Even if the expected discharge route is via groundwater, total recoverable metals should be evaluated to allow analysis under a high impact scenario. Federal permitting requirements specify the total recoverable digestion procedure as a basis for establishing permit limits. (85)

The soils baseline information fails to indicate what the attenuation potential is for the soils under the impoundment or in the percolation pond area. (130)

Response: Noranda does not propose direct discharge of excess water. As a result, state permitting requirements specifying the total recoverable digestion procedure as a basis for establishing permit limits are not applicable. Direct discharge without treatment probably would exceed surface water standards.

The decision to use dissolved rather than total recoverable metal concentrations for the loading analysis was based upon the mode of metal transport in ground water. Total recoverable analysis of metals is appropriate for surface water where metals are transported in the dissolved form or with sediments. Solid particles are generally not transported in ground water and metals are primarily transported as dissolved constituents. Therefore, it is the dissolved metal concentrations in the mine water discharge which are most likely to reach nearby streams via a ground water pathway. As a result, the agencies are recommending analysis of dissolved metals in ground water samples. These issues are discussed in greater detail under *Geochemical Attenuation/Plant Uptake* in the *Surface Water Quality* section of Chapter 4. As part of the proposed monitoring plan, Noranda would analyze surface water samples for total recoverable metals.

The soils in the land application disposal areas should have adequate capacity to filter suspended particles in discharged water (Camp, Dresser & McKee, Inc., 1991). Because the amount of attenuation that would occur cannot be estimated accurately, the water quality projections assume no attenuation would occur. Prior to discharge, excess water would report to a settling tank, similar to the tank currently in use at the Libby Creek adit. Surficial soils generally have clayey textures (see soils baseline report in permit application).

39WQ The data used in the loading calculations is not representative of the true constituents of that waste water. The rationale for using the dissolved method to characterize waste water is based on the assumption that the ground will 'attenuate' or cleanse the waste water of all of the larger particles, and hold them in that state for all time. This is an assumption which first must be proven before being used. (102, 248)

In its Petition, Noranda alleges that the leaching of mine waste water into Libby Creek and its tributaries will not have an impact on existing beneficial uses. Cadmium is one of the heavy metals Noranda proposes to disperse into the groundwater. Cadmium is highly toxic. Noranda says that geochemical attenuation will significantly reduce the cadmium concentration in groundwater. Morrison-Knudsen Engineers state, " [Analysis show that] there would not be significant attenuation of the tailings effluent chemical concentration." They expect up to 100% of the tailings effluent to leave the permit area and seep directly into both Little Cherry Creek and Libby Creek through springs in both creek channels. See Exhibit A. (1, 3, 92, 102)

The assumption that no attenuation of metals or nitrification of ammonia would occur is not realistic. Data submitted to the Water Quality Bureau and additional data collected by Noranda provide strong evidence that attenuation will occur. The length of time that attenuation would be effective can be estimated based on loading analysis of the soils involved. (258)

Response: The agencies' analysis assumed that there would be no attenuation of metal concentrations as the water moved through the soil, and all discharges would immediately reach surface water. Some attenuation of some metals, however, probably would occur. These issues are discussed in greater detail under *Geochemical Attenuation* in the *Surface Water Quality* section of Chapter 4.

40WQ The baseline data used to characterize the mine and impoundment water is inaccurate. EPA does not accept a dissolved analysis for impoundment waters. An analysis using the data for all metals involved would far exceed EPA criteria. (121, 126, 102, 164)

Response: The agencies revised the water quality impact assessment in the SDEIS. The revised analysis was brought forward and modified in the FEIS. The agencies analyzed applicable water quality data and used the data to develop estimated tailings, mine and adit water quality, as presented in Table 4-10. Chapter 6 describes how the agencies conducted the water quality impact assessment, the sources of the water quality data used in the assessment, and what assumptions were made for the assessment.

41WQ Mn concentrations below regulatory standards (0.05 mg/l) are achievable, provided that Montanore soils are similar, a large enough soil mass is available, and extrapolation of the results to low Mn concentration is valid. The actual size requirement may be more a function of the infiltration capacity of the soil than the attenuation capacity. (139)

The total Cu load during the three year application period is estimated to be only about 28 lbs. Thus, Cu should be even more effectively attenuated than Mn by the application area soils. (139)

Response: In general, metals attenuation by soils should result in a decrease of metals concentrations in ground water in the land application disposal area and in the tailings pond area. However, many of the specifics about how much water quality improvement would be provided by attenuation are not available. Attenuation may not permanently remove the metals from the ground water system. Metals attached onto soils particles can be released to ground water at a later time. In addition, "breakthrough" or soil saturation with metals also can occur. Eventually, all of the attachment sites would be filled and metals would pass through the soils without further reduction in concentration. (This is more likely to occur at the tailings pond site than at the land application disposal area if these areas are used for only a brief period of time as currently planned.) Finally, metal concentrations in excess water may be higher than currently anticipated. Although soil attenuation may reduce metal concentrations in ground water and subsequently lower projected surface water concentrations, it does not seem prudent to rely upon attenuation to meet surface or ground water quality standards. The agencies' analysis assumed that there would be no attenuation of metal concentrations as the water moved through the soil.

42WQ The simplistic "loading" calculation represents a clear "worst case" analysis and that it is overly conservative. The treatment of reported values below the detection limit as values at the detection is extremely conservative. The analysis assumes dilution with the 7 day, 10 year low flow discharge in Libby Creek. A review of the flow data collected during the collection of surface water quality samples suggests that Libby Creek in the reach between LB 800 and LB 2000 may not experience significant groundwater inflows on a continuous basis. Since dilution, dispersion, and adsorption may result in significant reductions in the concentrations of copper and manganese reaching Libby Creek, the analysis is overly conservative. (139)

Response: The agencies' loading analysis and assumptions are reasonable, conservative. and protective of water quality. State water quality regulations require that the loading analysis consider water quality effects during the 7-day, 10-year low flow. Since the 7-day, 10-year low flow is not available for project area streams, these flows were estimated using measured low flows from Granite Creek (see the *Hydrology* section of Chapter 6). Information provided by Noranda indicate that shallow ground water systems in the land application disposal area discharge to either Ramsey Creek, Poorman Creek, or Libby Creek. Therefore, surface water quality at LB 800 and LB 2000 would be altered by seepage from the land application disposal areas and from the tailings pond. Since the loading analysis is based upon the conservation of mass, dilution and dispersion would not reduce the amount of metals and other constituents, provided all excess water discharges to the streams. Adsorption (attenuation) may significantly reduce the amount of metals reaching receiving streams. However, the amount of attenuation is dependent upon the nature of the soils and the length of the flow path which cannot be accurately determined. In addition, metals sorbed (attached) onto soil particles may desorb and enter ground water at a later time. Given the uncertainty of hydrologic prediction, it is appropriate that the loading analysis be based on conservative assumptions.

Impact Assessment—Nitrates

43WQ The loading analysis assumed that in-stream flows would not be changed by water inflows into the mines, even though mining may cause groundwater that recharges one drainage (Ramsey) to be shifted to another (Libby), thus theoretically potentially affecting metals and nitrates concentrations in both streams. (227)

Response: Although water inflows into the mine might theoretically affect stream flows, the agencies' impact assessment in Chapter 4 provides a reasonable estimate of anticipated changes in surface and ground water quality. The proposed monitoring plan is designed to detect adverse changes in surface or ground water quality, and to ensure that beneficial uses are protected.

44WQ It appears that the SDEIS s projected concentrations for nitrates are lower than what has actually occurred at Libby Creek in the last two years. (227)

Nitrate/nitrite and ammonia data collected after 1/90 for the Libby Creek adit, percolation pond and downstream monitoring is directly related to activity inside the adit. Low concentrations may have less to do with attenuation or dilution than with when and how much blasting occurred right before samples were taken. It's certainly plausible that Noranda could arrange to minimize blasting during some period before water samples are scheduled to be taken. (227)

Response: The *Surface Water Quality* and the *Ground Water Hydrology* sections of Chapter 4 have been revised to reflect additional information from the Libby Creek adit on adit water quality and nitrate concentrations. Noranda sampled adit water at least hourly on three separate occasions to determine the effect of blasting on nitrate concentrations. Nitrate concentrations in mine and adit discharges increase with increasing blasting. This relationship is discussed in Chapter 4. Expected nitrate concentrations of adit water and projected nitrate concentration in Libby Creek have been increased based on additional information and analysis (see Table 4-10 of Chapter 4 and Chapter 6). A range of nitrate and ammonia concentrations have been analyzed to reflect the uncertainty associated with expected water quality.

45WQ Most disturbing about this is that the data in this document reveals that DSL and presumably DHES knew about the degradation, (and therefore knew about a violation of the Montana Water Quality Act) and the terms of the exploration permit, at least as early as September 1990 (page 159 [of the SDEIS]). Only as recently as November of 1991 has the State acted on the degradation problem. We consider all water quality projections in the SDEIS to be suspect because of what is occurring at the Libby Creek exploration project. The lack of response of the agencies to a clear enforcement problem throws into doubt the monitoring and enforcement "commitments" made in this document. (227)

Response: Timely Response to an enforcement problem is affected directly by statutory priorities, and staffing and funding levels. The following describes specifically what occurred with the Libby Creek adit.

DSL requires quarterly monitoring reports from Noranda for this project. The 1990 first-quarter report received May 16, 1990 was the first report to have indicated any problem. As that report was received after the onset of the field season, it was likely not evaluated until winter of 1990-1991. In that report the elevation of nitrates was slight. A significant elevation in nitrate levels did not occur until the second quarter. That report was also received during field season and was not evaluated at that time. Due to the number of activities with statutory timeframes ongoing through the winter of 1990-1991, no staff were available to evaluate the exploration reports. By spring of 1991, the Bureau lost its staff hydrologist. The monitoring reports of 1991 indicated that the nitrates problems were not temporary in nature and the Exploration staff requested that the WQB liaison evaluate the data. That evaluation wasn't completed until September 1991, due to lack of staffing and ongoing activities which had to be completed within statutory timeframes.

46WQ The Libby Creek Adit is being worked on right now. What is Noranda doing with the waste rock and mine water? What monitoring, if any, is being done? Are the results of those test available to us? (121, 102)

Will the results of ongoing waste rock assays be made available to interested parties such as ourselves? (121)

Response: Construction of the Libby Creek adit was permitted by the DSL under an exploration permit. All surface disturbances associated with the adit occur on private land. Waste rock is being stored at the site (see Figure 2-7). Following treatment to reduce suspended solids, adit in-flow water is being discharged to a land application disposal area/percolation pond constructed on-site. Noranda is collecting water samples for analysis on a monthly basis. Waste rock samples also are being collected for acid-base analysis. Acid-base analysis available at the time of FEIS preparation are presented in the *Geology* section of Chapter 3. All water quality data and all waste rock data collected as a part of the Libby Creek adit monitoring is available for public review at the Montana Department of State Lands. Noranda's exploration plan is also available at DSL's office in Helena.

47WQ Since nitrates are used on lawns and alfalfa to promote growth, then a small amount of nitrate in Libby Creek will promote vegetation and vegetation produces oxygen. What harmful effect can this have on our environment? (222, 198)

Response: As discussed in Chapter 4, *Fish and Other Aquatic Life* section, increased nitrates can result in increased algal growth. Too much algal growth is considered undesirable aquatic life and would be a violation of Montana water quality regulations. The section on nitrogen compounds has been revised to reflect additional data from the Libby Creek adit. Nitrates and nitrites also can have adverse human health effects. Projected nitrate concentrations, however, would not exceed drinking water standards under Alternative 3 (see the *Surface Water Quality* section.)

48WQ If the agencies assume ammonia will be reduced through nitrification, they should adjust upward by some factor their calculations for nitrate loading. (227)

The assumption that no attenuation of metals or nitrification of ammonia would occur is not realistic. (258)

Response: As the discussion in the *Surface Water Quality* section in Chapter 4 indicates, oxidation of ammonia to nitrate is expected to occur, increasing nitrate concentrations. The projected ammonia and nitrate concentrations following discharge of excess waters assumes, however, that no oxidation would occur. Increasing expected nitrate concentrations and decreasing ammonia concentrations by some factor would be arbitrary. Measured ammonia levels in Libby Creek below the adit are higher than ambient concentrations, but are below the surface water quality standard. A previous comment discusses metals attenuation.

49WQ The agencies should do an EIS on the exploratory adit in Libby Creek and defer analysis of the proposed Plan of Operations until information from the exploratory adit is available. (128, 130)

Response: The DSL completed an Environmental Assessment for the Libby Creek adit prior to issuing a permit. The EA is available upon request. The FEIS has been revised to reflect additional analysis using information from the Libby Creek adit.

Impact Assessment—Ground Water Quality

50WQ Noranda's proposal for control of groundwater pollution is inadequate on its face. (1)

The Draft EIS should have presented an analysis of the changes in concentrations of toxic substances in the ground water that we are to expect. This should have included a description of the ambient ground water quality, that amounts of substances being added to the groundwater by the waste water, and the expected resultant quality of the groundwater after disposal. (102)

The lack of analysis for groundwater impacts is a serious omission. How will the Board of Health be able to assess the impacts in their task of weighing the pros and cons for this project if the groundwater impacts are not disclosed? (248)

Page 108 [of the SDEIS] mentions a "mixing zone allowed by the Montana water quality regulations." There is no discussion of this elsewhere in the document. The document should discuss just what could be allowed for mixing zones. The public should be told now what the company and agencies are contemplating as for mixing zones. (227)

Response: Impacts to ground water were discussed in both the DEIS and the SDEIS. Ambient water quality is provided in Chapter 3. The *Ground Water Hydrology* section in Chapter 4 has been revised to include additional information on expected ground water impacts and mixing zones. Ground water standards can be exceeded in a mixing zone provided beneficial uses within the mixing zone are not adversely affected. Mixing zones for ground water are discussed in Rule 16.20.1010. For the Montanore Project, it is considered the permit boundaries (see Figure 2-3 in Chapter 2).

51WQ The EIS also states that the slow movement of ground water would keep the heavy metals out of the creeks, this is also misleading, while it is true that this ground is always saturated with water it is not true that it is stationary or that the toxics would not be moving through the water table. (58, 85)

Response: Ground water movement, relative to surface water movement, is relatively slow. However, this does not imply that ground water is stationary. Even under steady state conditions, ground water movement is occurring such that recharge to ground water systems equals the discharge from ground water systems. As discussed in the *Hydrology* section of Chapter 3, shallow ground water in glaciofluvial/lacustrine deposits on the east flank of the Cabinet Mountains flows eastward and discharges to Libby Creek. Therefore, any metals or other contaminants in seepage from the LAD areas or from the tailings impoundment would be transported by ground water flow into Libby Creek. For the purpose of projecting water quality changes that would result from the proposed mining operations, it was assumed that ground water from the land application disposal area and from the tailings pond would discharge instantaneously to Libby Creek.

52WQ Unless waste water reclamation can be assured virtually in perpetuity, tailings effluent will flow directly onto the ground surface and into surface water through seeps and springs. If this occurs, the ambient surface water will suffer major degradation. (1)

Response: As discussed in Chapter 4 of the EIS, rate of seepage from the tailings impoundment would decrease following cessation of operations. Noranda estimates this seepage would decrease after mining with estimates ranging between 70 and 290 gpm, depending on infiltration rate. Seepage at this lower rate would continue as long as precipitation percolates into the impoundment. Initial testing of the tailings material indicates that the tailings materials would not be acid generating. Tailings seepage water quality is expected to improve with time. Following operations, Noranda would continue to monitor surface and ground water quality in the vicinity of the tailings impoundment. If water quality problems are identified, remedies such as water treatment and capping of the tailing pond could be implemented.

53WQ Since 50% of the households in Lincoln Co. are supplied by private wells, some indication should be given to how many of these wells are in the Libby Cr. aquifer and have the potential of becoming unusable if something unforeseen happens from this mine operation. What are the stakes here if the groundwater becomes non-potable. (42)

Response: No ground water users have been identified in or immediately adjacent to the Montanore Project area. Ground water users are located downstream on Libby Creek. It is unlikely that they would be adversely affected by the proposed operations since the shallow alluvial aquifer in Libby Creek is discontinuous. Ground water quality in the mine workings, the land application disposal area, and the tailings pond area would change as a result of the proposed operations. These changes, however, would not exceed standards designed to protect beneficial uses, such as drinking water under the agencies' preferred Alternative 3C. The proposed surface and ground water monitoring program presented in Appendix B is designed to ensure that beneficial uses of water is not adversely affected. Mitigations to address possible surface and ground water quality problems are discussed in Alternatives 2 and 3.

Impact Assessment—Wilderness Lakes

54WQ Any threat to levels of lakes within the Cabinet Wilderness is unacceptable. A 100 foot avoidance distance does not appear adequate based upon the DEIS own admission. (123)

I support increased water quality monitoring with agencies or a third party doing the monitoring. Mining should not occur within 200 feet of the fault or 750 feet of Rock Lake. (117)

There is no quantitative information displayed to show that grouting could successfully arrest unanticipated inflows, or that the safety distance recommended for mining near Rock Lake and the Rock Lake Fault is sufficient to prevent lake damage. (130)

Basically in agreement with the proposed 500 foot avoidance distances separating mine workings from the Lake. However, we are very concerned over the arbitrary establishment of a specific avoidance distance between mine workings and the Rock Lake Fault. We conditionally support the proposed 100 foot avoidance distance as long as it can be easily adjusted as facts become available. We would strongly oppose any change in the flexibility of the operators rights. (148)

The DEIS is irresponsibly vague and unconcerned with the uncertainty regarding groundwater volumes and flow patterns in the project area. Concerns about possible lake or stream dewatering (through faults and cracks) and about possible very large (or very small) mine water discharges are not analyzed; they are simply answered with "something will be done." If grouting is necessary, how effective is it and how long does it last and what happens if or when it fails? If the amount of mine drainage is very large or very small, what are the resultant impacts on water quality and mine design/operation? (128)

How close to the workings is Ramsey Lake? How will it be protected? (121)

A major omission in the DEIS is analyses of the adverse impacts which could result from subsidence at the mine and resultant modification of the overlaying wilderness ecosystem. (85)

Response: Based on the agencies' analysis, it is unlikely that wilderness lakes would be affected by the proposed operation. Ramsey Lake, located outside the wilderness, is upstream of the proposed plant site and adit portal and would not be affected by operations.

Concerns about possible lake or stream dewatering are addressed in the FEIS by requiring mine water inflow monitoring, and monitoring of lake water levels in Rock Lake and St. Paul Lake (see Appendix B–Monitoring). Additionally, Noranda would be prohibited from mining within 100 feet of the Rock Lake Fault, and 500 feet of Rock Lake unless Noranda demonstrates to the agencies satisfaction that narrower avoidance zones would be acceptable. The agencies' analysis indicates these distances should be sufficient to prevent intercepting water stored in the fault, and affecting Rock Lake. The agencies' analysis is presented under *Subsidence* in the *Geology and Geotechnical* section and the *Wilderness Lakes* in the *Surface Water Hydrology* section of Chapter 4.

Noranda is grouting fractures in the Libby Creek adit currently under construction and no problems with its effectiveness have been reported. Noranda estimates that grouting in the Libby Creek adit has been 80 percent effective (DSL inspection report by W. Jepson, 12/11/91). Noranda indicated that grouted rock areas generally last longer than the mine operating life (Noranda Minerals Corporation, 1989d). If grout failures do occur during operations, mine water inflows would increase until the fractures can be regrouted. Following operations, it is anticipated that the underground working would flood until discharge at the adits occurs. Grouting failure post-operations would increase the rate in mine inflow. As grouting failure occurs, the mine would fill more rapidly with ground water, and post-mining discharges from the adit would increase if water levels are higher than the adit levels.

Because the ground water conditions in the mine area can not be precisely known, there is some uncertainty associated with mine inflows. This uncertainty is discussed in the *Surface Water Quality* section of Chapter 4. If mine water inflows and precipitation are less than projected, the disposal of excess mine water in the LAD areas may be unnecessary. Noranda would have to use alternative sources of makeup water, discussed under Alternative 1 in Chapter 2. If mine water inflows are greater than currently anticipated (sustained flows >1,200 gpm), Noranda would implement the mine water control program described in the *Water Use and Management* section of Chapter 2. Possible controls include increased grouting, segregating mine waters from adit waters, storing excess water in the tailings impoundment, or increasing excess water discharge. If ground water inflows are very large, it may be necessary to dispose of excess water in the LAD area throughout the mine operation. The effects of this discharge on Libby Creek in combination with seepage from the Little Cherry Creek tailings impoundment could result in greater water quality changes than those projected in the FEIS. The agencies may require water treatment if necessary to ensure protection of beneficial uses.

55WQ Told that the orebody lies under several lakes, between two major faults, in an area of multiple subfaults. What tests have been done to identify probable problem areas? (121)

Response: Several faults have been identified in the mine area. These are discussed in the *Geology and Geotechnical* section of Chapter 3.

56WQ Regarding room and pillar mining at this site: Widespread faulting in the area suggests the rocks are deformed and they may dip nearly vertical in some parts of the mine. Since the present mine plan is conceptional and based on a limited number of drill holes, it would seem impossible to draw detailed surface, mine maps, and cross sections. (31)

Response: Chapter 2 has been revised to include additional information on the ore body characteristics. Based on a limited number of drill holes, there is no indication the rock strata are nearly vertical. The ore body slopes from 5° to 50° to the northwest.

Impact Assessment—Erosion and Sedimentation

57WQ No adequate analysis is provided of increased water and sediment yields in Libby Cr. due to project and the cumulative effect of additional timber sales and this project. (42, 127, 102, 152)

The disturbance of the surface, the vegetation and infiltration capacity of the soil on some 1025 acres in Libby Cr. by Noranda will surely effect the water and sediment yields greater than 1,025 clearcut equivalents and will make an already bad situation worse. To even talk about harvesting operations in addition to this project in such a high precipitation area is folly. Please examine the sediment yield of this creek and determine if we can stand another 1,025 CCE acres added to it. (42)

Development and use of a detailed site-specific erosion control plan developed by a knowledgeable party, can reduce sediment effects from the project to a minimum. A monitoring plan should be adopted to document the effectiveness of the plan, and modifications to improve sediment control can be made. (192)

Given the amount of erosion and sediment transport that has occurred in the past in the Libby Creek drainage, it is questionable that the BMP's for logging practices are working. Simply stating that BMPs will be used is not sufficient. It must be demonstrated that the BMPs are capable of controlling conditions so that water quality standards are met. (248)

Why are there no plans for enforcement of Best Management Practices: that the text is riddled with abstract, nebulous, "soft" statements such as "Noranda would promptly treat the distressed areas" and "implementation of remedial measures to relieve localized distress would be a maintenance activity" (200)

The mine project must be included with the timber sale water and sediment yield analysis and that no increase in sediment is acceptable at this time. (42)

Peak flow water and sediment yields in Libby Cr. were unacceptably high last week end. Once again the hydrologic limits of Libby Cr. have been exceeded and we can't stand the additional runoff from the Noranda project as well as the future timber sales in the area. (42, 91, 102)

Response: Increased stream flow as a result of the proposed mining operation is discussed in the *Surface Water Hydrology* section of Chapter 4 and was found to be inconsequential except during periods of low flow. Increased runoff and erosion from mining disturbed areas as a result of vegetation removal and reduced infiltration is expected to have little effect outside the area disturbed by mining.

Surface disturbances associated with the proposed operations would be 1,270 acres, 994 acres of which is associated with the tailings impoundment. The remainder of the disturbed area (about 280 acres) would consist of adit and plant site areas, land application disposal areas, waste rock storage areas, and roads. During operations, the tailings pond would collect runoff from adjacent areas and precipitation falling on the impoundment. Runoff and sediment from the embankment would collect in the seepage collection system. Following reclamation, the tailings pond would be revegetated and erosion protection installed on the embankment. Because of its flat post-operational topography, the tailings impoundment would provide relatively little runoff to receiving streams.

Runoff and erosion from other disturbed areas may increase during operations. However, runoff from these areas would be controlled by Noranda's runoff and sediment control system or, in the case of mine and access roads, by culverts and ditches. The technology for controlling runoff and sediment at mine sites has been extensively developed since the passage of the Surface Mining Control Act in the 1970s. As a result, runoff and excess sediment from mining disturbed areas would not be a problem in receiving streams provided that sufficient runoff and sediment control is constructed, is properly operated, and is adequately maintained. It would be the regulatory agencies' responsibility to ensure that this occurs during operations.

Since Noranda has proposed to control runoff and sediment from mining disturbed areas, mining runoff and sediment control is based on proven technology, and because the area of surface disturbance not including tailings pond is so small (less than 1% of the watershed above station LB 2000), runoff and excess sediment is not expected to adversely affect streamflow in Libby Creek. Detailed analysis of increased water and sediment yields from the proposed mining project and from timber sales is therefore not warranted. The agencies analysis of cumulative effects from the Montanore Project and timber sales is discussed in the *Cumulative Impacts* sections of Chapter 4.

The agencies anticipate that the proposed BMPs and Noranda's proposed sediment and erosion control plan (see *Erosion Control* section under *Alternative 1* in Chapter 2) would be effective in controlling erosion. The agencies would monitor the implementation of these plans during construction and operations to ensure that BMPs are properly implemented and maintained. If excessive erosion and sedimentation are observed, additional BMPs would be required.

Some cumulative effects from proposed timber sales and the Montanore Project may occur. Timber sales may increase sediment and streamflows in Libby Creek. Future timber sales will be evaluated on a case-by-case basis, and an analysis of effects will be conducted by the KNF prior to sale. Detailed analysis of future timber sales is outside the scope of the EIS.

58WQ The document doesn't discuss possible peak flow increases from the project. Table 4-8 [of the SDEIS] completely misses any projection of how peak flows of Libby Creek will be increased by this project. We ask that this be addressed. (257)

You have not addressed what the projected increases would be under peak flow conditions. Please do so. (42, 170)

Air photos show the Libby Creek stream channel from Crazyman Creek to the Kootenai is not stable. Peak flows seem to be occurring more often. EIS must address the affects of this project on Libby creek during peak flows. Please address the reach of Libby Creek from Crazyman Creek to the Kootenai River. (127)

Response: Estimated changes in Libby Creek streamflow under low and average flow condition are provided in Table 4-8 in the *Surface Water Hydrology* section of Chapter 4. Under average flow conditions, streamflow increases in Libby Creek would be less than one percent. Streamflow increase under high flow conditions would be even less.

Increased runoff and peak flows as a result of removal of vegetation and other surface disturbance are also not expected to be significant. As discussed in the previous response, the tailing impoundment area would likely yield little runoff during or following mining operations. The surface disturbance area which would yield increased runoff constitutes less than one percent of the total watershed above LB 2000 (Libby Creek below the confluence with Little Cherry Creek.) Therefore, increased runoff from the area disturbed by mining should have little effect on peak flow in Libby Creek.

59WQ During a Forest practice BMP audit of a sale in Little Cherry Cr., cumulative effects were analyzed but sediment yield was not for this particular sale. This is unacceptable to not analyze the sediment yield of this project in combination with planned timber sales for peak flow situations of Libby Creek since Libby Cr. has the highest bedload movement of any coming out of the Forest. (42, 127)

Response: Since runoff and sediment control would be provided for disturbed areas, most of the sediment leaving the mine site would be fine grained and would contribute to suspended sediment load rather than bed load.

60WQ If flooding were to occur, the flow would probably follow the topographic low, resulting in erosion of the tailings impoundment which would transport tailings into Libby Creek. Additional overflow ditches should be dug as a preventative measure. (170)

We have found that when diversion ditches are used flows increase. Please address peak flows from a 24 to 48 hour storm and where the water will go. (91, 127)

About diversion ditches to be built around the impoundment site, it doesn't say where the water is going to go or what potential problems it might cause. (42)

More detail is required, proposed runoff diversion channel into Bear Creek. Why must Bear Creek be impacted? What are the specifications of this diversion channel? (121)

Response: The tailings impoundment would require the construction of two permanent diversions. One diversion would be constructed early in the operations to route flow from upper Little Cherry Creek around the tailings impoundment site. This diversion would direct flow into a small unnamed tributary to Libby Creek and then into Libby Creek. The channel is designed with the hydraulic capacity for the 6-hour Probable Maximum Flood requirements, while the two-foot riprap on the channel sides is designed for the 100-year flood flow. The agencies have reviewed the design criteria for the channel and found them adequate. The diversion channel has been designed to prevent erosion of the tailings impoundment. As part of Alternatives 2 and 3, Noranda would design a channel that would provide adequate erosion protection from the outlet of the Little Cherry Creek diversion channel to Libby Creek.

The second diversion, constructed during reclamation of the tailings impoundment, would direct flow into Bear Creek to ensure long-term stability of the impoundment dam. Water from the reclaimed impoundment would be conveyed to Bear Creek through a riprapped diversion channel as part of Alternative 2. The effects of these diversions are discussed in the *Surface Water Hydrology* section of Chapter 4.

61WQ Pg. 400 [of the DEIS] should be revised to indicate:

1. Timber production is not the primary function of this MA.
2. Special harvesting procedures and guidelines will be established for timber harvest as needed.
3. Special considerations will be made for protection of reclaimed slopes and soils in all activities within this MA. (139)

Response: The agencies considered these proposed revisions. Revisions 1 and 2 have not been incorporated into proposed MA 31 to be consistent with other MAs. Revision 3 has been added to MA 31 standards.

Impact Assessment—Downstream Effects

62WQ Noranda disagrees with the DEIS interpretation that manganese is a toxic and deleterious substance and must be regulated under the non-degradation policy. The discussion of non-degradation and of the anticipated environmental impacts should focus on anticipated impacts to beneficial uses. (139)

Response: Manganese is listed in Quality Criteria for Water 1986 referenced in the definition of a toxic and deleterious substance [ARM §16.20.603 (25)]. A discussion of beneficial uses has been added to the *Surface Water Quality* section in Chapter 4. The *Fish and Other*

Aquatic Life section of Chapter 4 describes potential impacts to the beneficial use of aquatic life.

63WQ What does manganese have to do with T& E species in the Kootenai River? The EPA "Gold Book" indicated that there is not a toxicity issue for freshwater organisms related to manganese. (258)

Response: The text has been clarified to indicate that manganese is used as an example of expected metals loading in the Kootenai River.

64WQ Concerning cumulative impacts on the Kootenai River, two bottom feeding species of fish are approaching extinction in the Kootenai River below Libby Creek, sturgeon and burbot. Studies on the accumulation of metals in fish tissue should be done in the Kootenai River and studies on metals concentrations in sediment and in water should be done before any permit is granted. (248)

The effects of sedimentation are underestimated in the DEIS and the SDEIS. The reality is that the fine sediments will be washed into the Kootenai River, where they will likely impact beneficial uses, especially when considered as a part of the cumulative effects of the Kootenai River basin. (192)

The Kootenai River is already being impacted to the point that existing beneficial uses are jeopardized. (192)

Response: A revised discussion of sediment effects in the *Fish and Other Aquatic Life* section of Chapter 4 indicates that the proposed project is expected to contribute a minor proportion of the total fine sediment load in Libby Creek, relative to contributions from other disturbed lands in the watershed. Also, as discussed under *Kootenai River* in the *Surface Water Quality* section of Chapter 4, measurable water quality effects attributable to the project are not expected to occur in the Kootenai River. While this discussion emphasizes chemical water quality, the same arguments also address concerns about potential effects from the project on sediment loads. Thus, available analyses and best professional judgement indicate that contributions of either metals or sediments resulting from project operations are not likely to occur at detectable concentrations in the Kootenai River. Data collected from the Kootenai River from below the Kootenai Dam by the U.S. Geological Survey and presented in Chapter 3 indicates that measured water quality parameters are below surface water quality standards designed to protect beneficial uses.

The FEIS states that "discharges from the project would not impact white sturgeon populations or culture efforts in Idaho." While not discussed in the FEIS, these same arguments apply to burbot, which do not have a special management classification in Montana. Most of the problem experienced by declining populations of sturgeon and burbot in the Kootenai River appears to result from the operation of Libby Dam, and not from metals loading (Doug Perkinson, KNF Fisheries Biologist, personal communication).

65WQ One of the most sensitive areas in the Kootenai River system must be the Creston Valley Wildlife Management Area, a huge wetlands area set aside for the benefit of water fowl. Deposited sediment studies including metals content should be done at this wetlands area as a cumulative impacts investigation for this Draft EIS. Cumulative impacts on the Kootenai River before it reaches these wetlands should also be investigated. (102, 164)

Response: A discussion of the potential effects to the Kootenai River has been added to the *Surface Water Quality* section in Chapter 4. Significant effects to the Kootenai River are not anticipated. Analysis of effects to the Creston Valley Wildlife Management Area are outside the scope of the EIS because it is outside the area potentially affected by the project.

66WQ How extensive is the area expected to be affected by water degradation? (20)

Response: Changes in total dissolved solids, hardness, nitrates and some metals are expected to occur downstream on Libby Creek beyond station LB 2000 (below the confluence of Libby Creek and Little Cherry Creek. Changes in these parameters other than nitrates may be small and not great enough to be measurable. At all locations, however, surface water quality standards and present and anticipated beneficial uses must be maintained.

67WQ Notice to Idaho seems especially pertinent, since the effects of the ASARCO Mine at Troy are not yet fully evident and the cumulative impacts on the Kootenai River deserve a watchful eye. Idaho must be given the opportunity to determine (1) whether the Montanore Project will jeopardize Idaho water quality standards and (2) whether such jeopardy, if present, accommodates Idaho interests. (144)

Response: The Idaho Department of Health and Welfare has reviewed and commented on the SDEIS. Other Idaho state agencies were sent copies of the DEIS and the SDEIS for review and comment (see Chapter 7 in the DEIS and the SDEIS for a discussion of consultation and coordination). These agencies also are welcome to participate in the nondegradation proceedings.

Impact Assessment—Catastrophic Events

68WQ An issue not addressed in either document is that of catastrophic discharge to the watershed. For example, the location of the haul road adjacent to Libby Creek represents a high potential for discharge of concentrates in event of a vehicle accident. Dismissing such events as insignificant due to their infrequent nature is inappropriate. The effects of one such event may last many years and contribute significant load to downstream water bodies. (192)

Response: As discussed in Chapter 2, the Bear Creek Road is preferred over the Libby Creek Road because it has fewer stream crossings. Noranda's spill prevention and contingency plan addresses spills on the access road. Detailed analysis of potential spills is not possible. Potential effects would depend on proximity to surface waters, type and quantity of chemicals spilled, streamflow at time of spill and other unpredictable factors.

69WQ A worst case scenario is needed for spills. (10, 126, 121, 158)

Although the Draft included analyses of risks of catastrophes and described measures to minimize these risks, there seemed to be little or no planning for recovery if a catastrophe were to actually occur. Resources for containment and control of such situations should be identified and retained in advance. (41)

Has any thought been given to chemical spills at the mine site and leading to the mine from Libby - Kalispell? (18)

Has any thought been given to possible storage of Haz/matt Response materials at mine and in Libby? (18)

What chemicals will be used in the Assay Office? How will assay office wastes be disposed of? (121)

Mining operations bring in fuel for surface vehicles and when they spill or change oil, they will just let it spill into the unconfined aquifers. The reagents are truly lethal. (31, 102)

Response: Noranda has developed an Oil and Hazardous Materials Spill Prevention and Preparedness Plan. This plan is part of the permit application. Reagents described in the FEIS would be used in the mill, and other acids, bases, and other chemicals would be used in small amounts by the analytical laboratory at the site. Propane and diesel fuel is stored in above-ground storage tanks. Noranda's plan provides for prompt remedial actions, thus adequately addressing potential spills.

Small quantities of chemicals would be used in the assay office. Some wastes would be generated at the office, some of which may be hazardous. Any generated wastes, such as oil or assay wastes, would be disposed in accordance with applicable solid or hazardous waste laws and regulations.

70WQ What effect would a large avalanche have on the millsite in the Ramsey Creek valley? Would reagents be spilled? Tailings slurry pipelines be ruptured? Would there be a threat to human life? Would trees blown down as a result of a large avalanche cause a reagent spill, pipeline rupture, warehouse collapse? Does Noranda have a spill containment plan in the event of a climax type avalanche? (26)

Not enough study has been given to the likelihood of "climax" avalanches in Ramsey and Libby Creeks. (26)

Response: The Ramsey Creek mill site has been located to avoid snow avalanche chutes. There are no avalanche paths on the north side of Ramsey Creek where the access road and tailings pipeline are proposed. However, the access road leading to the mill site may be affected by avalanches on the south side of the valley. Such an avalanche would threaten the safety of traffic on the access road at the time of the avalanche and vehicles may be trapped in the avalanche. Since the tailings pipelines follow the access road, the pipelines may also be affected. Should the tailings pipeline be ruptured by an avalanche, the leakage sensing system would be triggered, and the mill would be systematically shut down.

Impact Assessment—Reagents

71WQ Recommend the agencies require Noranda to prepare a chemical balance that tracks and quantifies the amounts and potential toxicity of the xanthate from mill to tailings pond to groundwater to surface water. If not, the agencies should demonstrate conclusively that the amounts of xanthate to be used at Montanore will not be toxic to aquatic life. (212, 227)

The DEIS does not discuss the toxicity of processing reagents. Will the reagents migrate from the tailings pond to the surface water? What does it break down into? Is the chemical harmful to human, animal or plant? Is it stored in the fats or tissue of animals or humans? Stored by plants surrounding impoundment area? Can wildlife absorb and store this chemical after drinking water from the impoundment area? Short or long term health damage to humans or wildlife? Would other chemicals used in the mining and milling operations be listed to the public if new processes are utilized? Will it be in a publicly accessible document, how soon would the public be notified if mining method or extraction process occurs or if a hazard to health occurs from mining operations? (23, 120, 102, 130, 170, 227)

The description of reagents and their ultimate disposition is inadequate. Chemical names should be supplied and pertinent regulatory statements concerning each reagent should be a part of the EIS. Send copies of these statements and any additional information that would provide a better understanding of the plans for ore processing, storage, and disposition of residue. (29)

Page 190 - Questions reagents (chemicals) used in milling process. What is K Amyl Xanthate? What is Percol 352 and MIBC? What does "generally not toxic" (page 190) Please supply several current analyses of Troy tailing water. (31)

One of the most critical hydrologic issues is the fate of reagents used in the milling process. Some of the questions that need to be addressed are:

What Volume/day of these reagents would report to the tailings facility? What would be their concentrations in tailings material and where would these concentrations be the highest?
How many tons of reagents would ultimately be stored in the tailings facility?
What is the solubility and leaching potential of used and fresh reagent compounds in the tailings facility? In a spill or pipeline rupture at the millsite?

Could reagent compounds become soluble and/or migrate within the tailings to enter the groundwater system?
At what concentration would these reagents become toxic to aquatic life?
Would residual reagents in the tailings material enhance solubilities of the sulfide minerals and as a result, increase the acid generation potential of the tailings materials and/or waste rock dams? (26, 126, 102)
What is the toxicity of these reagents to aquatic life? To game? To plants? (121)
How much of each reagent will be in the tailings? In the concentrates? (121)
What is the half-life of each? (121)
What are their products of decomposition? (121)
Over what period of time, under what conditions of temperature, light, etc. do they decompose? (121)
What kind of bioavailability do they and their break-down products display? (121)
At any stage in the process of decomposition, are they synergistically toxic with each other or with other substances present in the tailings? (121)
How will the reagents be transported to the site, and what will be done with the empty containers? (121)
An appendix showing the chemical constituent of the reagents listed in the table would allow the reader to see what additional chemicals will be placed in the tailings storage site beside the native rock. (117)

Is ASARCO using the same reagents, in the same proportions, at Troy? (121)

If there is uptake of metals by vegetation in a wetland, presumably there is uptake of metals and mill reagents in seepage water from a tailings impoundment. This issue needs to be properly addressed. (121, 153)

What levels of toxicity could be expected with complexing and increased availability due to flocculants and as a result of chelation? Aquatic life quality standards are exceeded for all of these toxic elements. (58)

Response: Additional discussion on the use of organic reagents in ore processing has been provided in the section on ore processing in Chapter 2. The FEIS presents a revised discussion of the anticipated concentrations and effects of proposed reagents in the *Surface Water Quality* section of Chapter 4. Adverse effects to aquatics life are not expected. Material Safety Data Sheets, which summarize available toxicity data for the reagents proposed for use, are presented as an appendix. Any change in reagent use would have to be presented to the agencies for review and approval.

Impact Assessment—Acid Drainage

72WQ To prevent the dissemination of acidified ground waters resulting from contact of oxygenated, CO2-rich water with billions of sq. ft. of broken underground rock surfaces, all such rock must be "sealed" directly at the rock fragmentation surface. Sealing is best achieved by use of surficial contact concretes or impervious concrete chambers within the in-site environment. (141)

Response: Post-operational mine water quality is unknown; Noranda anticipates that post-operational mine water quality would be similar to bedrock ground water quality in the area (see data for spring SP-16 in Table 3-18). Because of the occurrence of sulfide minerals in the ore, in the barren zone, and possibly in the rock overlying the underground workings, generation of acid mine water is possible. Mine water quality would be monitored during and following operations.

Alternatives 2 and 3 would require Noranda to consider both outflow and water treatment options to control post mining outflow and prevent the exceedance of water quality standards. The most appropriate remedy would be submitted for agency approval prior to implementation.

73WQ It is unacceptable for the DEIS to dismiss post-operational water discharges from the mine and tailings impoundment as 'unpredictable at this time.' Some extrapolation from known data should be possible, and this information is needed, given that these water discharges are going to continue for a very long time. (121)

The quality of the post-mining adit discharge is still largely an unknown. Because of this the agencies say post-mining monitoring will be required. This promise needs to be fleshed out now so the public knows what liability it could be assuming. (227)

Response: Post-operational discharges from the mine and the tailings impoundment have not been dismissed because they cannot be accurately projected. Noranda has predicted that post-operational mine water quality would be similar to bedrock ground water, and has committed to plugging the mine if monitoring indicates that mine water discharge would not meet applicable water quality standards.

However, as discussed in Chapter 4, Noranda would be required to monitor ground water inflows to the mine to provide a better prediction of whether discharge would occur from the mine adits following operations, and to predict the expected quality of the discharge. Since plugging is primarily a flow control technique rather than a water treatment technique, Alternatives 2 and 3 would require Noranda to consider both flow control and water treatment techniques to meet water quality standards if discharge would exceed standards. The agencies would review and approve plans for post-operational management of adit discharge prior to implementation.

74WQ You can't hold water back in the mine with plugs of concrete. After active mining ceases and the water pumps are turned off, water will flow out of this giant hole in the ground through cracks and joint surfaces. (31)

The document seems to believe adit plugging is a viable option. Our research indicates adit plugging has been limited in scope as well as success. In the highly fractured geology of the Cabinets, it's likely it could result in new point sources of adit water. Recommend the agencies develop a contingency-based, post-closure collect-and-treat strategy that ensures Noranda pays for cleaning up pollution if caused, for as long as is necessary. If a plug and walk away option is viable, the DEIS should provide details. (227)

Response: The agencies agree that successful plugging of the adit would not prevent discharge of the mine water along natural pathways (fractures). The *Ground Water Hydrology* section of Chapter 4 discusses the agencies' analysis of adit plugging. As discussed, adit plugging would likely have little effect on mine water quality. Noranda would be required to monitor post-operational mine water quality and discharges. If the discharges violate water quality requirements, adequate mitigation, which may include water treatment, would be required. As discussed in Chapter 4, Noranda would be required to monitor ground water inflows to the mine to better predict whether discharge would occur from the mine adits following operations, and to predict the expected quality of the discharge.

75WQ Where is the assay data for the orebody, host rock and waste rock from the Troy Mine? (121, 130)

There is not nearly enough information about acid mine waste. (58, 123, 102)

Relying solely on Noranda's indications is unsatisfactory. The agencies must conduct independent tests to determine acid formation potential of the barren zone rock, the surrounding rock with anomalous lead content and the tailings material. Sufficient data concerning the formation of acid materials must be determined in advance of permitting. (51)

Analysis performed by Noranda indicate the tailings would not be acid forming. What type of analyses have been conducted? Have the agencies obtained independent confirmation of these "indications"? Acid drainage and acid formation problems reportedly exist at ASARCO's current Troy mine operation. The ore

Noranda proposes to mine is very similar to that at Troy. Why do the Agencies believe that similar problems with regard to acid formation will not occur. (51, 102, 164)

Too few acid-base analyses done on waste rock within the mine, both barren zone and wall rock, to predict acid-mine drainage potential. Too few acid-base and total digestion analyses performed on tailing material to predict acid-mine drainage potential. (126, 164)

Acid mine drainage potential has not been thoroughly investigated. (126, 130)

Suggest that due to the uncertainty in the acid rock drainage (ARD) analysis, and limited treatment options available once ARD starts, additional consideration be given to Alternative 3, construction of a water treatment plant. Treatment plants can react to changes in discharge water quality more quickly than passive systems, hence provide additional protection against accidental discharge. (192, 227)

The information on acid forming potential presented in the DEIS is inadequate. EPA would like information on how successful and accurate the testing of the ore body for acid mine drainage production potential is. (85)

It should be determined in advance of permitting if the materials to be used in the impoundment dam will be acid generating. If so, measures should be developed to mitigate the problem. (51)

The agencies should employ a qualified third-party technical review team to examine the potential for acid mine or rock drainage at Montanore. Noranda should detail in this DEIS exactly what that procedure will be. Acid base potential testing should also have been done on material that replicated tailings, done on rock, ore, etc. representing the same size fraction as those that will be produced at the mine. It is unclear whether Noranda's tests did this. (227)

The attention given to the possibility of acid drainage has been much improved in the SDEIS. Data should be assembled and presented that shows the concentrations of parameters in the mine discharge water at Asarco/Troy over time. (248)

The data base available which was collected using current technology does not indicate an acid generation problem. (258)

Although placement of acid-generating waste rock below the post-mining water level may reduce potential adverse effects, such effects still could occur for several reasons. Oxidation of the waste rock could occur before the post-mining level is established. In addition, ground water commonly contains dissolved oxygen and oxidation could occur even after the post-mining water level is established. Also given the varied metal content of waste rock, conditions which may be restrictive to dissolution of some metals may not be restrictive to others. Therefore, careful consideration of geochemical conditions for all phases of waste-rock handling for all depths of potential disposal and potential solute movement may be warranted to help avoid adverse effects to ground-water quality. (35)

DEIS fails to analyze possible impacts from and Responses to acid mine drainage, acid-producing tailings material. (128)

Response: Following issuance of the DEIS, Noranda analyzed geologic samples from the mine area using appropriate methods to determine the samples' acid-forming properties. The agencies also collected available information from the Troy Mine, and from ASARCO's Rock Creek Mine permit application. The *Geology* section of Chapter 3 has been revised to include this additional information on acid-base potential. This information provides a basis for the agencies' revised analysis of acid drainage, presented in the *Surface Water Quality* section of Chapter 4. It is uncertain whether acid drainage would occur. As discussed under *Acid Drainage* in the *Surface Water Quality* section of Chapter 4, the Troy Mine may not be an exact analogy to Montanore, but it is probably the best predictor for determining whether the Montanore Mine or tailings would become acid generating. Mine discharge and tailings water at the Troy Mine remains nearly neutral. Additional testing and monitoring for acid generation would be conducted during operations.

Additional testing for acid formation would be conducted as part of Alternatives 2 and 3. Water treatment for acid drainage would not be necessary at the initial stages of the project. The hydrologic monitoring which would be conducted during the operation, coupled with the additional testing for acid formation, would be used to predict post-mining water quality. Noranda also would be required to monitor post operational mine water quality and discharges. Long term water treatment may be necessary if water quality standards cannot be maintained after mine operations.

76WQ If ore at Montanore will be the same as that at Troy, and Troy doesn't produce acid mine or rock drainage, why was acid-base analysis done? (227)

Response: Although Montanore and Troy ore are similar, site specific acid base analysis provides the best information on the acid generating potential of Montanore ore and waste rock.

77WQ A comprehensive estimate of the sulfide available (total mass) on mine opening surfaces would be far more useful for predicting acid generation than maps of sulfide occurrence. (258)

Response: The agencies are requesting maps in the likely event that there is considerable variation in sulfide concentrations in different portions of the mine.

78WQ If the use of potentially acid forming rock in the dam could cause acid drainage problems, how can the Agencies state that acid formation is not expected to impact reclamation efforts? (51)

Will the metal-bearing waste rock be used in site and tailings impoundment construction? What measures are in place to ensure that this does not happen? How will it be stockpiled to avoid metal leaching from acid precipitation? (121, 102)

Response: Nearly all waste rock comes from adit development. Noranda's permit application states that no deposition of waste rock from production mine development (or in other words, from the barren zone) would occur above ground. The waste rock from the adit also contains sulfides. Alternatives 2 and 3 would require Noranda to conduct additional acid-base analysis prior to using waste rock for construction purposes. This additional testing is described under Alternative 2 in Chapter 2.

79WQ Noranda proposes to mine 60% of the Cu-Ag deposit and leave 40% for pillars (page 177), but in the next sentence that is raised to 70% and only 30%. Whatever the mining practice, Noranda will leave a gaping hole under the Cabinet Wilderness, and the area will collapse leaving a porous, fractured mountainside vulnerable to extensive leaching of toxic metals into the subjacent watersheds. (31)

What happens if the 'barren zone' between the ore bodies fractures and/or collapses? (128)

Response: The *Mine Plan* section in Chapter 2 has been revised to indicate that an estimated 67% of the mineable reserves would be removed. Actual amounts would depend on final pillar sizing, which would be developed during detailed mine planning. Some fracturing and collapse of the overlying rock is expected. Pillars should prevent wide-spread collapse. The agencies' revised analysis relative to subsidence is presented in the *Geology and Geotechnical* section of Chapter 4.

80WQ Nearly all waste rock comes from adit development. Waste rock that will be hauled to surface will be the result of adit and pre-production mine development below the "barren zone." Page II-29a of the permit application indicates that no deposition of waste from production mine development or, therefore, from the barren zone would occur above ground. (139)

Response: Based on Noranda's preliminary mine plan, very limited disturbance in the barren (lead) zone would occur during the pre-production phase. Reaching the upper ore zone would require disturbing the barren zone. The volume of waste rock from the barren zone would be small in comparison to the waste rock from the adits and below the ore zone.

81WQ What about pyrite (iron sulfide)? Does it go to the smelter - or does it remain as pulverized sulfide in the mine wastes. (213)

Response: The Montanore Project ore contains very little iron sulfide. The mineralization is predominantly copper and copper-iron sulfides, including bornite, chalcocite, and chalcopyrite. Any pyrite in the ore would be include in the concentrate or disposed as tailings in the impoundment.

82WQ The DEIS refers to a 'halo' of low-grade galena surrounding the orebody, and veins of galena and pyrite in the waste rock. Where are the assay results? (91, 121)

Response: Chapter 3, *Geology and Geotechnical*, includes information on the low-grade galena (lead) zone between the two copper-silver zones. Representative high and low grade lead concentrations are provided in Table 3-10.

Water Balance

83WQ There is more than 8,000 gpm of process water unaccounted for in the water budget. This means there would not be enough dilution for most of the year for Libby Creek to be buffered from the toxic effects of these heavy metals. Libby Creek would become another Silver Bow Creek unfit for life and unusable for other purposes, and the Kootenai River, a blue ribbon trout stream in Montana would be polluted and sterilized. (58)

Are the water balance assumptions correct? Seems you can't know what assumption is correct until you're underground. Shouldn't you do a "range of effects" analysis rather than a point estimate based on water balance? (25)

Consider more intense review of water balance, including excess water estimates and net precipitation. Using more likely figures in the water balance, CRG estimates that the disposal of approximately 2,000 gpm of excess tailings water will need to be decanted off of the tailings pond and disposed of in the perc ponds. (248)

The Draft reflects considerable doubt about the project water balance. Given the problems Noranda has already encountered in driving the Libby Creek adit, the Agencies can assume that water inflows will be considerably higher than initially projected. What new measures have the Agencies developed to handle these higher amounts of water? Handling and disposal of high volumes of water may be a significant problem during the initial phase of the project and during the early years of production. What modifications to Noranda's proposed water balance program will the Agencies require to handle these increased volumes? (51)

What does Noranda propose to do with surplus mine water in the highly probable event that the mine produces much more than the projected quantity of water? (121, 144)

A complete water balance plan should be in place in advance of permitting. Agencies should not allow Noranda to proceed on a "learn as you go" basis. The water balance program must be in place prior to permits being issued and must be developed in conjunction with a thorough water treatment system. (51, 102)

Response: The water balance contained in Chapter 2 has been revised to reflect Noranda's current estimates. As discussed in Chapters 4 and 6, actual volumes in the water balance probably would vary from those shown in the water balance and those used in the impact assessment. The agencies reviewed Noranda's proposed water balance in detail and conclude that the water balance presented in Chapter 2 provides reasonable estimates with which to analyze expected impacts.

Noranda has monitored adit discharges since the beginning of the Libby Creek adit construction (Figure 4-2). Discharges ranged up to about 230 gallons per minute. The agencies' used 280 gpm of Libby Creek adit discharge in the loading analysis. The *Surface Water Hydrology* section of Chapter 4 has been revised to provide additional analysis of the measured adit inflow and Noranda's estimate.

If adit or mine water inflows are greater than currently anticipated (sustained flows >1,200 gpm), Noranda would implement the mine water control program described in the *Water Use and Management* section of Chapter 2. As part of Alternatives 2 and 3, Noranda would provide the agencies with information concerning the actual project water balance. Noranda would implement a contingency plan if sustained inflows are greater than 1,200 gpm. Possible controls include increased grouting, segregating mine waters from adit waters, storing excess water in the tailings impoundment, or increasing excess water discharge. If ground water inflows are very large, it may be necessary to dispose of excess water in the land application disposal areas throughout the period of operations, or to install a mechanical water treatment system. The effects of any increased discharge over that used in the analysis on Libby Creek could result in greater water quality changes than that projected in the FEIS.

84WQ A water budget is used to show the expected path for all water used in mining as well as excess water. CRG does not accept a zero gallons per minute rate for water going into the disposal area. (126)

Response: The section on *Water Use and Management* in Chapter 2 and on *Surface Water Quality* in Chapter 4 has been revised. Land application disposal areas would be used to dispose of the excess mine and adit water during mine development and during the later years of proposed operations. Currently, Noranda does not anticipate having to dispose of excess tailings pond water in the land application disposal areas at any time during development or operations. Should the permit be issued and the proposed operations proceed, a water balance monitoring program (Appendix B) will be implemented to identify variations from the projected water balance. Noranda has developed a contingency plan which would be implemented in the event of excess water inflows, either to the impoundment or into the mine or adits. This contingency plan is described in Chapter 2 and is discussed in the previous response.

85WQ It should be clarified that the seepage estimate (475 gpm in Year 16) was developed using a conservative method during preliminary engineering studies in 1989, prior to the detailed field investigations referenced above, which were conducted in 1990. (258)

Calculations using the new data indicate the seepage may be on the order of 120 to 300 gpm for bedrock aquifer thickness(es) of 100 to 300 feet, respectively, and impoundment water level at 3700-foot elevation. (258)

Response: The above referenced revised seepage estimate is presented by Morrison-Knudsen Engineers, Inc. (1990c) in terms of "the current maximum estimate of seepage from the impoundment not intercepted by the dam drains" (embankment drain system, consisting of the blanket drain and trunk drains). The range in the estimate is due to the assumed range in bedrock aquifer thickness and presence or absence of pumps in the relief wells. In the analysis, MKE assumed the total quantity of flow intercepted by the relief well system would be fifty percent groundwater and fifty percent impoundment seepage, because of the recognized confined (artesian) nature of the aquifer. Additional analysis by MKE indicates that by Year 16, 97 percent of the flow intercepted by the relief well system would be tailings seepage. Seepage from the tailings impoundment would result in localized groundwater mounding beneath the site; because of this mounding, it is anticipated that the larger fraction of intercepted flow would consist of tailings seepage rather than groundwater. Artesian groundwater inflow to the well system from downgradient of the wells is anticipated to be small due to smaller driving heads and resulting gradients.

86WQ (Figure 2-12 [of the DEIS]) shows 671 gpm of water from the tailings impoundment to the mill. Why is this pipeline not discussed in the DEIS nor shown in any of the diagrams? What is the estimated embankment seepage rate in Year 10? (121)

Response: The pipeline used to carry water from the tailings impoundment back to the mill follows the pipelines used to transport tailings from the mill to the impoundment. The text in Chapter 2 has been revised to reflect the proposed return water pipeline. As shown in Figure 2-13, estimated embankment seepage in Year 10 is 593 gpm. Embankment seepage would be impounded by the seepage collection dam and returned to the impoundment.

Water Treatment

87WQ Are the proposed alternatives really the best available technologies? (250)

Noranda has assured us of negligible, if any, water quality impact with their current monitoring plan. We feel that the water quality treatment plant as proposed is superfluous, and financially wasteful, since its efficiency has not been proven, and cannot be guaranteed. (114, 238)

Response: The water management/treatment options discussed under Alternative 3 are reasonable alternatives designed to reduce or minimize effects to water quality. Two other treatment systems, wetlands and electrocoagulation, were considered but dismissed as reasonable alternatives.

88WQ The discussion and data on treatment technologies is too skeletal. Because treatment is an important and relevant issue, removal efficiencies should be better detailed. (227)

The agencies should explore combining treatment technologies—say, reverse osmosis and irrigation/land application—to see if desired water quality can be achieved. A depiction of "removal efficiencies" should be replaced with projected effluent water quality. The expected "ranges" displayed in Table 2-9R [of the SDEIS] are not very enlightening. (227)

Response: More testing and analysis would be necessary to provide more definitive removal efficiencies and projected effluent water quality. If Option A or B under Alternative 3 is the selected alternative, Noranda would complete additional testing and analysis of discharge waters prior to submitting final treatment design to the agencies for review and approval. Option C under Alternative 3 would require submittal of a revised water management and monitoring plan. Prior to approval, the agencies would require an analysis showing that water quality standards would be met. A combination of treatment technologies may be required.

89WQ The agencies have not demonstrated what the projected benefits of water treatment are at the low concentrations levels of the constituents of concern. For example, if the concentration of Ag in the mine effluent and in the creek is below the standard detection limit, what is the expected efficiency of metal removal for any of the proposed treatment schemes, how can that efficiency be measured, and what is the incremental improvement over the current proposal? The SDEIS implies that, although existing water quality will not be maintained and a waiver of the non-degradation rules would still be necessary, there would be a benefit in reduced effects on water quality. If such a benefit is expected it should be quantified as should any projected changes in impacts as beneficial uses. (258)

Tables 2-9 and 2-9a [of the SDEIS] refer to "typical efficiencies" and "conceptual costs" for several water treatment processes, however Noranda is not aware of any of these processes being applied to mining operations as discussed or "routinely" costed for mining operations. The FEIS should unequivocally point out that there are significant uncertainties in both the technologies and costs discussed in relation to the water treatment technologies discussed in the SDEIS. (258)

Response: The removal efficiencies presented in Table 2-13 are generally not concentration dependent. For example, the evaporator would remove 99 percent of metals regardless of metal concentrations of the influent. There is more uncertainty associated with the reverse osmosis and ion exchange systems. The discussion of *Alternative 3* in the *Surface Water Quality* section of Chapter 4 indicates the uncertainty associated with water treatment. The discussion of *Alternative 3* in Chapter 2 has been revised to indicate additional testing and analysis would be necessary to verify the removal efficiencies presented in Table 2-13.

Water treatment, however, unquestionably would reduce metals and nitrate loadings to Libby Creek. The incremental benefit to beneficial uses cannot be quantified. The agencies developed water treatment as an alternative in response to concerns over water quality. It will be up to the Board of Health and Environmental Sciences to decide if the reduction in metals and nitrate loadings and the reduction in uncertainty is worth the cost of mechanical water treatment.

90WQ The SDEIS makes numerous references that the evaporator system would be the most effective of the three water treatment systems considered in Alternative 3. The agencies recommend Alternative 2 which does not appear to include any of the water treatment alternatives. Why do the Agencies recommend an Alternative which does not include water treatment? (203, 204)

Why the four agencies continue to favor remediation over prevention is a mystery, especially after considering the irreversibility and magnitude of the consequences once degradation of water quality is "discovered" (239)

Concurs that the preferred alternative to utilize would be Mine Alternative 2. Suggest that the surface water issue be modified to include water treatment as a safety factor, only in the event that actual future water quality does not meet predicted quality. (225)

Consider construction of water treatment plant. Treatment plants can react to changes in discharge water quality more quickly than passive systems, hence provide additional protection against accidental discharge. (192, 250)

Support consideration of additional alternatives that take steps to prevent water quality problems associated with the project, rather than those that rely on mitigation and clean-up at a later date. Measures to prevent discharge of sediment and metals to the Kootenai River watershed, however small those discharges may be, are appropriate, given the status of the Kootenai River in Idaho. (192)

Response: As discussed in the previous comment, the decision to require mechanical water treatment will be made by the Board of Health and Environmental Sciences. The agencies recommend Alternative 3, Option C, which does not include the initial installation of a mechanical water treatment system for a number of reasons. The agencies' analysis of effects on surface water quality indicates that applicable water quality criteria for constituents other than metals would be met. It is uncertain whether applicable water quality criteria for metals would be met. As part of the agencies' preferred Alternative 3C, Noranda would develop a design which would reduce impoundment seepage. The agencies provided gravels drains as an example of such a system. Reducing impoundment seepage would reduce the uncertainty associated with tailings water quality, seepage quantity, and the effectiveness of the pressure relief/seepage interception system.

The monitoring program detailed in Appendix B is designed to provide early notification of changes in water quality that would adversely affect beneficial uses. It is the agencies' opinion that water treatment could be applied if changes in water quality that would adversely affect beneficial uses occur.

91WQ The logic presented in the scheme to manage excess water is elusive. The greatest threat to water quality appears to be the tailings impoundment, and the large volume of water designed to seep through it. If the only acceptable means of tailings disposal is in an impoundment, isn't it reasonable to ensure that all contaminants remain in place, rather than encouraging them to become mobilized? (250)

Also recommends that an amended DEIS address the option of collecting all seepage from the tailings impoundment, perhaps through a liner and collection system. (227)

Response: Alternative 3A has been revised to include full lining of the impoundment and mechanical treatment of all excess water. With a liner, all collected tailings water could be used in the mill, and adit water unaffected by mining would be excess.

92WQ Any discussion of treatment should include information on the amounts and quality of sludges produced and how and where they will be disposed. Sludges containing metals are hazardous materials and may be regulated substances. (227)

Response: The discussion of water treatment alternatives in Chapter 2 contains information on sludges. Sludges produced by water treatment may be regulated wastes. If such wastes are hazardous, proper handling and disposal under applicable regulations would be required. The amount and quantity of sludges cannot be estimated without additional design and testing. Chapter 4, *Surface Water Quality*, includes additional discussion of sludges and their disposal.

93WQ Noranda must be required to minimize the impact of its proposed mining operation on existing water quality through the construction of water treatment facilities, designed to treat all water from the proposed operation. The Land application disposal area concept for mine water disposal should not be permitted. (51)

Response: Montana water quality regulations require that the existing surface and ground water quality not be degraded by the proposed operation. Noranda has petitioned the Board of Health and Environmental Sciences to change surface and ground water quality. Land application of excess mine water would be acceptable provided that the petition is granted and water quality standards are not exceeded.

94WQ The DEIS presentation of three treatment technologies at conceptual design stage is misleading to the general public, unnecessary and beyond the scope of the DEIS. (139)

Noranda has failed to adequately explore water treatment alternatives. Telephone calls to two companies with no experience treating metal concentrations at this level is not a sufficient examination of treatment alternatives. Noranda must provide water treatment or modify its proposed development plans to eliminate the pollution of Libby Creek and its tributaries. (Section 75-5-303(2) of the MWQA). Noranda clearly has not given due consideration to waste treatment alternatives. (1)

Response: The agencies considered water treatment alternatives which may result in less effect on water quality as part of Alternative 3. The alternatives were developed in response to the significant issue of protection of water quality. Evaluation of water treatment alternatives was conducted independently of the analysis presented in Noranda's petition.

95WQ The FEIS should clearly indicate whether treatment would be required only for a few years or throughout the life of the mine under Alternative 3. (139)

Response: Mechanical water treatment would be required as part of Alternative 3A as long as it is necessary to discharge excess mine or adit water having concentrations above ambient concentrations.

96WQ Questions that must be answered about the wetlands option include: (1) What are risks of contamination to wildlife using the wetland, and (2) What is the ultimate fate of metals-saturated plants removed from the wetland. (146)

The artificial wetlands is a good example of how we can produce the materials we need and care for the environment. It seems like a win/win solution to the problem of waste water. (57, 87, 110)

EPA believes that the long term disposition of the toxic metals that accumulate in the wetlands should be discussed. Are the proposed artificial wetlands, saturated with elevated levels of toxic metals, to be left in perpetuity? What impacts will this exert on ground water quality, the ecosystem? Does the USFS have information which will support this level of treatment success, especially over long periods of time? (85)

Passive wetlands systems do not treat discharge. They merely temporarily immobilize some metals and adsorb some nitrogen species... Discharging polluted water into wetlands can result in cleaner water on the output end but it's hard to control and adjust. (130)

Wetland water treatment systems may be relatively benign in habitats like that found at the Pennsylvania Mine in Colorado. But that habitat at 11,500 feet in elevation could not be more different from the Little Cherry/Libby Creek area. The Pennsylvania Mine is located high above timber line in a very harsh environment. The Little Cherry/Libby Creek area is a lush forested area rich in habitat to virtually all species of wildlife in the area. (87)

Trading toxic water for toxic plants, concentrating the impact of pollutants within a vital ecosystem, risking the disruption and damage of the entire food chain cannot be a viable solution to the waste water dilemma. (87)

Forest Service neglected to discuss the impact of wetlands water treatment on wildlife in the DEIS. A Critical consideration in selecting a water treatment plan. FS discussion of this alternative is therefore deficient. Impact of wetlands water treatment on wildlife must be examined in order to assess the most environmentally responsible water treatment program. (87)

On page 71 of the DEIS, in the discussion of a wetlands water treatment system, is the comment that 'vegetation may require replacement as it becomes saturated with metals'. If a moose comes along and eats this metal-saturated vegetation, what happens to the moose? What happens to the tribal member who shoots and eats the moose? (121)

Commenter regrets that the wetland mitigation proposal was dropped, although we recognize that it is unproven and may have some technical limitations. (250)

Noranda should be required to install and operate both the proposed Wetlands treatment system and one of the other proposed systems, perhaps the evaporator treatment system. The Wetlands system cannot handle the full water treatment requirements. The Wetlands system would not be fully operational for at least two years, it may not be fully effective and it lacks flexibility with regard to expansion. Additional water treatment capability would be required during any vegetation changeover periods. (51)

Response: The agencies have dismissed wetlands from consideration as a water treatment system because of the uncertainty associated with its effectiveness. The reasons for dismissing wetlands are discussed in the *Alternatives Considered but Dismissed in this EIS* section of Chapter 2. Water treatment systems considered in the FEIS include evaporation, reverse osmosis, ion exchange, and land application.

97WQ There must be more than one way to do this [water] treatment or perhaps post a bond so that if the mine didn't do the treatment the State could. (44)

Response: Several water treatment systems applicable to treat mine waste water are described as part of Alternative 3 in Chapter 2. Other treatment methods may be available. Noranda, with agency review and approval, would select a treatment method if the Board of Health and Environmental Sciences requires water treatment. As discussed in Chapter 1, Noranda would be required to post a reclamation bond which could be used to provide treatment, if necessary, after operations.

Baseline Water Quality Data

98WQ Why does the Petition exclude arsenic, chromium, lead and mercury in the ground and surface water quality limits. The Burnside Mineral Report provide reviews of the mineral deposits and mining history in and around the Cabinets. (58)

Response: Baseline surface and ground water quality data for the Montanore Project area are provided in Chapter 3, *Surface Water Hydrology*. The data show that the average total recoverable concentrations (surface water) and dissolved concentrations (ground water) for arsenic, chromium, lead, and mercury are at or below analytical detection limits. These metals may occur in mineral deposits in the Cabinet Mountain range; however, they are not expected to be released to surface and ground water in measurable quantities. The *Surface Water Quality* section in Chapter 4 provides the agencies' projected concentrations of arsenic, chromium, lead, and mercury in surface waters. The monitoring program would include analysis for arsenic, chromium, lead, and mercury.

99WQ The data used to characterize the the ambient (or background) water quality at the four stations used in the loading calculations is defective. All data obtained after January 1990 in Libby Creek cannot be considered background (or baseline) data. (227, 248)

Response: Ambient concentrations of water samples collected in September during the three year monitoring period (1988-1990) were averaged and used to estimate average low flow concentrations for the loading analysis. Noranda began discharging water from the Libby Creek adit in January, 1990. Since this discharge affected nitrate concentrations in Libby Creek, the September 1990 nitrate concentrations were not used to calculate ambient water quality conditions. With the exception of nitrate concentrations, water quality at the stations during the low flow periods does not show any effects from adit discharges; most concentrations of metals are at or below the detection limit.

100WQ Actual flows are not given for either of the tables [6-7 and 6-9 in the SDEIS], and even the time of year of sampling is not presented in Table 6-9. If sampling was done in May, this is not likely to be a low period. (229)

Response: Table 6-9 has been revised to include sampling dates and measured flows. Measured flows at time of sampling are higher than estimated low flows and lower than estimated average flows.

101WQ The EPA does feel that concerns over the adequacy of existing baseline information has been partially resolved [in the SDEIS]. A commitment to lower detection limits, additional parameters and additional data is good. However, there is still not sufficient data at the appropriate detection limits to provide an adequate baseline for impact analysis. (229, 243)

CRG feels that the baseline data for water quality monitoring is inadequate. (248)

New lower detection limits should be employed on data analysis NOW, so that baseline is comparable with monitoring and so that the BHES has complete information before it decides on Noranda's petition. (227)

Some parameters are missing that could occur in the affected area. There should be baseline data gathered on these metals. (248)

Response: Analysis of additional metals and the use of lower detection limits are now proposed as part of Alternative 1. The agencies acknowledge that water quality information using lower detection limits may have reduced the uncertainty associated with the agencies' analysis. The detection limits used for the water quality analyses, however, are just one component of the analysis and one aspect of the analysis that has lead to the assessment's uncertainty. For some metals, such as arsenic, the surface water quality standard is lower than an achievable detection limit using approved EPA methods. There will always be uncertainty associated with these metals. The agencies' proposed monitoring program for aquatic life is quite extensive and is designed to detect adverse changes to fish and other aquatic life. Changes to other beneficial uses are not anticipated.

102WQ Baseline surface water quality data should be collected now from Poorman Creek, and information from groundwater wells in the Ramsey Creek percolation pond area should be made available as soon as possible. Loading calculations for Ramsey Creek and Poorman (if needed) should be adjusted. (227)

There is no baseline groundwater information that can be used to help determine the water quality impacts of the percolation ponds (130).

Loading calculations and conclusions of whether discharge will exceed standards are based on information for two monitoring sites, LB 800 and LB 2000 (Tables 6-9 to 6-23 [in the DEIS]). These are the wrong sites to use because they don't detect degradation in lower Little Cherry Creek, Ramsey Creek and upper Libby Creek, just below the evaluation adit. (130)

Response: Poorman Creek was sampled during baseline characterization (see Table 3-14). Data is contained in the baseline water resources report (Chen-Northern, Inc., 1989). Poorman Creek also is sampled as part of the interim monitoring program. The *Ground Water Hydrology* section of Chapter 3 has been revised to include information on ground water in the Ramsey Creek land application disposal area (see Table 3-18). The loading calculations presented in the *Surface Water Quality* section of Chapter 4 have been revised to include analysis of effects on surface water quality in Poorman Creek and Ramsey Creek.

103WQ RA 600A is actually approximately 1000 feet away from the original RA 600 site. Sampling data from the new site [RA 600] cannot possibly be statistically correlative to the data obtained from RA 600. (201)

The lack of adequate sampling coverage and absence of any baseline data for RA 600A indicates that the proposed water quality monitoring program is severely flawed and that it needs to be modified and strengthened prior to the issuance of any permits. (201)

Response: Station RA 600 A would be adequate to monitor changes in water quality in lower Ramsey Creek. Water quality in Ramsey Creek does not change significantly over a 1,000-feet length. For example, there are only minor differences in water quality at station RA 200 (near the proposed plant site), and RA 600 (several miles downstream near the confluence with Libby Creek).

104WQ While RA 600A presumably would detect water quality problems originating upstream from its location, there is no sampling site to monitor changes in water quality that would occur from the disposal of water at Percolation Pond Site No. 2 and possible Percolation Pond Site No. 1, as discussed in the SDEIS (page 108 and 157). (201)

The monitoring plan should be amended so that there are surface water quality stations to assess the impacts of the Ramsey Creek and Libby Creek percolation ponds and plant site. Instead of using LB1000, a site should be established on lower Poorman Creek and one on Ramsey Creek below the percolation ponds. (227)

Surface water samples collected at LB 800 would not provide more meaningful data than Noranda's proposed monitoring program. Additionally, the land owner adjacent to Site LB 800 has requested payment of $5000 for collection of each individual water sample from this site. (139)

With the relocation of sampling site LB 800 to Little Cherry Creek, the nearest source of water quality data would be site LB 1000, approximately 1.75 miles The lack of baseline data for RA 600A, the location of RA 600A and the relocation of sampling site LB 800 indicate that the proposed water quality monitoring program is deficient in its coverage. (201)

Libby Placer Mining Company (LPMC) would like to register its objection to certain references and representations in the Draft on page 57 and 369 about location of data collection facilities located on fee lands owned by LPMC. (51)

The Forest Service has been on notice for some time that Noranda has not obtained nor sought permission to use or cross LPMC lands. Any permits to be issued by the relevant Agencies must be contingent upon Noranda securing the necessary permission from LPMC to use LPMC fee lands for the desired purposes. By authorizing Noranda or its agents to conduct activities in violation of LPMC rights, the Forest Service and any other government agency becomes liable for civil and criminal trespass. (51, 52)

Response: All proposed monitoring locations are on public lands. Land owner restrictions prevent establishing monitoring stations closer than those proposed. Monitoring locations on Ramsey, Poorman, and Libby creeks would be located to detect water quality changes from discharge to the land application disposal area. An upstream station would be placed on Poorman Creek as part of Alternatives 2 and 3. Wells have been established to detect changes resulting from discharge of excess water at the land application disposal area.

105WQ There is also a deficiency in the analysis of impacts. There needs to be loading calculations for the stations RA 600 and LB 800 for the year 16 for impacts from the use of perc pond 1. The analysis at LB 2000 is not sufficient for this activity. (248)

Response: Chapter 6 discusses that the projected impacts from discharges to the land application disposal area in Year 16 would be less than those projected for Year 3 of construction. Consequently, a loading analysis in Year 16 at locations other than LB2000 was not conducted. Projected water quality changes in Year 3 of construction is presented in the *Surface Water Quality* section of Chapter 4.

Monitoring—Evaluation of Data

106WQ You have not addressed the question of after what length of time and/or what set of events you will conclude there is an adverse effect, nor have you addressed what you would do about various possible adverse occurrences. Until you address these questions, monitoring remains an expensive, but meaningless, activity. Specifically answer the following: (1) is ignoring an identified problem an accepted response? (2) does challenging the monitoring method get the company off the hook - can't challengers to monitoring methods and techniques be addressed now? (43, 181, 230)

The EPA generally agrees with the goals of the monitoring programs, however they are concerned about the implementation of these goals. (229)

The document does not detail the specific conditions that would trigger future commitments to deal with currently unknown impacts, example: Though Noranda and the agencies commit to address acid mine drainage or acute toxicity in fish, should they occur, they never say what specific conditions would trigger operational changes to correct the situation. (227)

What criteria will be used to support the finding that pollution of surface or ground waters have or will occur and what criteria will be used for biological effects. (229)

Consider closer scrutiny of the project including expanded independent monitoring. (239, 245)

The Tribe recommends the highest level of monitoring since it increases the likelihood of discovering impacts at the earliest time. The ability to measure future impacts depends on the completeness of the baseline data set. It is imperative that at least sites LB-1000 and LB-2000 be increased to two each. (250)

Possible revisions to mine operations based on problems uncovered in monitoring should be detailed now. The commitments and how they will be enforced should also be spelled out before a record of decision is issued. (227)

The Tribe endorses the monitoring plan included in Alternatives 2 and 3, with the stipulation that there be specific plans for rapid compliance with water quality standards once any violations in standards are discovered. (250)

The subject of corrective actions planned in the event such monitoring reveals data outside of established parameter limits is not even addressed. (163)

Response: Appendix B has been revised to provide additional discussion on how the monitoring information would be reviewed and what steps would be taken to ensure that beneficial uses are protected. A conceptual flowsheet for the review of monitoring data is presented in Appendix B. The agencies, however, must maintain flexibility to respond to particular monitoring results. Providing specific criteria would eliminate the needed flexibility.

As has been discussed extensively both in these Responses and in the EIS, water quality is a complex issue with a number of uncertainties. In response to the uncertainties and complexities, the agencies have developed a monitoring program unparalleled for a mining project.

107WQ How will the public be invited to participate in these reviews and how will public participation be encouraged? (229)

Response: Water quality information collected by Noranda and submitted to the agencies is available for public review at the agencies.

108WQ What is specifically meant by "appropriate corrective actions?" The EPA suggests that the end results, which is that the impact is eliminated or mitigated for, be used in this language and that this language be in the permit requirements. (229)

EPA recommends a more explicit identification of Responses to be taken by Noranda if monitoring evidences water quality criteria violation or toxic effects. Will adequate bonding provide for remedies and corrective action. (85)

Response: Appropriate corrective actions include changes in proposed operating plan which would result in compliance with applicable regulations. Specific corrective actions would depend on the cause and magnitude of the exceedance of water quality criteria. Adequate bonding would be collected to implement necessary post-operational actions. Chapter 1 has been revised to provide additional information on bonding.

Monitoring—Plan Specifics

109WQ The EPA feels the proposed detection limits for metals are unacceptably high for several parameters. (227)

The EIS should not indicate that detection limits equal or below the surface water aquatic standards would be used when there is no indication that they can consistently be achieved using methods required by DHES. The lower detection limits for surface water analysis should be specifically defined in the FEIS. (258)

Response: Analysis of additional metals and the use of lower detection limits are now proposed as part of Alternative 1. The detection limits proposed by Noranda would be either below surface water standards, where possible, *or* the lowest that would be consistently achievable using approved EPA methods. Appendix B has been revised to provide numeric target detection limits. The proposed detection limits would be adequate to achieve the objectives of the monitoring program.

110WQ The lower detection limits available to the project and to the Agencies will not necessarily provide a better estimate of changes to water quality as some of the in-stream and discharge constituents will likely remain at levels below the lower limits. (258)

Response: If actual concentrations are above lower detection limits, lower detection limits would provide a better characterization of changes in water quality. Without analysis using lower detection limits, one would not know if actual concentrations are above or below the lower detection limits. Besides providing possibly a better characterization of water quality, another purpose of using lower limits would be to determine if water quality standards are being exceeded.

111WQ The proposed monitoring plan is incomplete because it does not specify that there will be regular, unannounced compliance checks by the agencies. (227)

Response: Appendix B discloses that the agencies would conduct independent monitoring.

112WQ The monitoring should include a requirement that Noranda immediately notify the agencies of any accidents, emergencies or nonpermitted change in operations. (227)

Response: Noranda's spill prevention plans include notification of the agencies of any accidents or emergencies. Significant changes in operations would require a modification of Noranda's operating permit.

113WQ Who are the "appropriate agencies" for water quality? (227)

Response: Appendix B discusses that the Kootenai National Forest, Montana Department of State Lands, and the Montana Department of Health and Environmental Sciences would review the water quality monitoring results.

114WQ Grease, oil, diesel and gasoline should be added to the protocol for surface and groundwater monitoring at the stations below areas where heavy equipment is used. (227)

Response: Normal use of grease, oil, diesel, and gasoline would not significantly affect surface or ground water quality. Since direct discharges are not anticipated and all discharges would be to land application disposal areas, percent oil and grease is not recommended for analysis.

115WQ It is unclear if Table B-2 (R) applies to both surface and groundwater monitoring. If not, it should. (227)

Response: This table (now Table B-3) has been revised to clarify that the analytical list would pertain to both surface and ground water monitoring.

116WQ Will groundwater stations 5 and 10 monitor effluent moving from the Ramsey Creek percolation ponds to Poorman Creek? This is unclear. (227)

Response: Ground water monitoring wells 5 and 10 are located to monitor effluent moving from the Ramsey Creek land application disposal areas to Poorman Creek. Well 10 may also monitor ground water discharging to nearby reaches of Libby Creek.

117WQ When will the additional groundwater monitoring wells be in? They should be installed immediately so that an adequate baseline can be established before construction and production starts. (227)

Response: Monitoring wells in the Libby Creek adit area, Ramsey Creek land application disposal area, and in the plant site area have already been installed. Data from these wells have been collected and are on file with the agencies. Under the agencies' preferred Alternative 3C, additional monitoring wells would be installed in the Little Cherry Creek land application disposal areas. Any additional wells in the plant site area and tailings impoundment area would be installed during the 2-to-3-year construction period. This period would provide the opportunity to establish an adequate baseline prior to operations. Monitoring would begin after well installation.

118WQ Recommend that both total and dissolved analysis be done for the groundwater monitoring stations established between the percolation ponds at Ramsey and Libby Creek and the streams themselves. (227)

Response: As discussed in Appendix B, the agencies are recommending analysis of total recoverable metals in surface water samples and dissolved metals in ground water samples. This analytical protocol would be adequate to meet the objectives of the monitoring plan.

119WQ Figures B-1 and 2-3 (R) [of the SDEIS] should show the percolation ponds on Libby Creek. (227)

Response: Figure 2-5 has been revised to show the land application disposal area/percolation pond at the Libby Creek adit site.

120WQ The statement that Noranda would be responsible for the cost of monitoring plans needs clarification. Noranda will be responsible for the cost of approved monitoring plans required by the permits. Noranda will not commit to fund an undefined level of agency or third party monitoring. (258)

Funding - Noranda is not willing to commit to funding an unknown/open ended level of agency QA/QC in any or all of the Appendix B monitoring programs. Noranda is committed to design and operation of thorough and adequate QA/QC programs for all monitoring. Agency compliance monitoring should be funded out of agency budgets. (139)

Response: Noranda would be responsible for the cost of the monitoring programs. The agencies would be responsible for funding any compliance monitoring conducted by the agencies.

121WQ Noranda should also be required to fund the hiring by the State of a full time water quality professional dedicated to monitoring the Project's water quality. (51, 102)

Monitoring must be carried out by an independent government agency and not by the mining company. Total disagreement with the "Annual Report" section in Appendix B. (163)

Sampling and testing funded by Noranda and conducted by interested, qualified private citizens. (115)

Response: There is no regulatory requirement that an independent government agency conduct operational monitoring. State and federal mining regulations contain no provisions requiring Noranda to fund hydrologic monitoring by private citizens. The DHES is responsible for ensuring compliance with the Montana Water Quality Act. The agencies would collect samples periodically to ensure permit compliance. Noranda would submit sampling data after each sampling period. In an annual report, Noranda would submit all unedited laboratory data and all results of its quality control sampling.

122WQ You do not have a monitoring program if you do not have adequate and completely comparable baseline data. (102)

Response: The baseline data provides an adequate basis to predict and assess impacts. The kind of data collected during monitoring would allow comparison to baseline data. Since metal concentrations in ambient waters and water quality standards are extremely low, water quality standards are likely to be a more useful "yardstick" by which to evaluate monitoring data than are baseline data.

123WQ Also, more frequent sampling than 5 times a year is needed to be able to rule out natural variation. Sampling should be done at the very least monthly, and perhaps twice a month. (248)

Response: The agencies feel that the proposed sampling frequency (5 times a year) under Alternatives 1, 2, and 3A, when coupled with the baseline data, would provide adequate information on natural variability. Monitoring plans may be revised if the proposed frequency is not adequate.Under the agencies preferred Alternative 3C, monitoring of stations potentially affected by discharges to LAD areas, and of upstream "reference" stations would be monthly or twice-a-month during the first year of construction (see Appendix B). Monitoring frequency after the first year would be decided after reviewing the first year's monitoring data.

124WQ The comparison of flows measured at RC 100 and lake levels for the alpine lakes with flows measured in the underground mine will not provide a valid method to determine a possible connection between the bedrock water and surface water features (139)

Response: The agencies' proposed monitoring plan no longer includes measurement of flows from Rock Lake. The fluctuation in flows, both seasonally and annually, would make it difficult to determine a possible connection between the bedrock water and surface water features. Proposed flow measurements in the mine and lake level monitoring would be adequate to determine any substantial connection between bedrock water and surface water features.

125WQ Libby Lakes were dropped from the lake monitoring program with USFS approval because the Libby Lake fault trace lies east of the lakes. It remains Noranda's position that monitoring of the Libby Lakes is not warranted. (139)

Response: The monitoring program (Appendix B) has been revised; Libby Lakes would no longer be monitored. Noranda would monitoring lake levels in Rock and St. Paul lakes. The agencies are dropping monitoring of Libby Lakes since they are unlikely to be affected.

126WQ Noranda cannot identify any need for continuous flow monitoring at LB 2000. (139)

Response: Continuous flow monitoring would be used in conjunction with the biological monitoring program to assess impacts to fish and other aquatic life.

127WQ Please provide a description of means to assure compliance with plans for mitigation and restoration measures. Should require adoption of some standard techniques such as performance bonds or escrow payments to assure that resources are adequate when the time comes to take restorative action or alter protective methods. (41, 120, 158)

Response: As noted in Appendix B, Noranda and the agencies have developed various environmental monitoring programs which would be implemented in the first quarter of construction of the mill and tailings impoundment and maintained during the life of the project. The primary purpose of these monitoring programs is to measure compliance with quantitative standards and regulations. Additionally, the operating permits from the State and USFS would contain stipulations requiring compliance with specific operating requirements, such as mitigation and restoration measures. As part of permit issuance, the DSL and the KNF would require Noranda to post a reclamation performance bond to ensure adequate funds for reclamation. Revised Chapter 1 includes a bonding discussion.

128WQ Close monitoring by Noranda should be initiated to insure no loss of surface water quality. (13)

The monitoring of the mine should be conducted by Montanore with supervision by state and federal agencies as the HRMIA and NEPA dictate. (110, 150, 158)

The proposed plans for water monitoring and protection are still too generalized to be effective. (115)

Response: Noranda's proposed surface water monitoring program has been revised by the agencies; the monitoring plan which would be implemented is summarized in Appendix B. The monitoring plans' objectives have been included in Appendix B. The proposed monitoring plans would be adequate to meet the plans' objectives.

129WQ There is no plan to monitor Libby Cr. downstream from its tributaries, and there is no plan to monitor the Kootenai River at all. (10, 152)

Is Noranda prepared to do baseline and ongoing water quality monitoring, and sediment tests, on the Kootenai River at Libby and downstream at least as far as Troy? In our opinion, this is absolutely essential. (121, 126, 102)

Response: The proposed hydrology and aquatic life monitoring plans include monitoring at station LB 2000, downstream of all project disturbances. Monitoring at this station would be adequate to detect impacts downstream of the proposed project. Because the primary concern is related to possible changes in water quality as a result of the proposed operations, monitoring is best conducted in the receiving stream closest to the project. Downstream, dilution by increased stream flow would makes the identification of water quality changes more difficult or impossible. Ambient water quality concentrations for most constituents are at or below analytical detection limits. Therefore, no monitoring stations on Libby Creek below LB 2000 or on the Kootenai River are believed to be necessary. If water quality changes are identified at LB 2000 during monitoring, additional downstream stations could be required.

130WQ Monitoring of diffuse mine flow is not feasible but net "inflow" will be monitored by measurement of mine outflow of all adit discharges and process water use. (139)

Response: In addition to monitoring net inflow by measuring the outflow of all adit discharges and process water use, it is also possible to measure mine inflow to various portions of the mine. This is done by directing inflow from discrete fractures (if they are sufficiently large) or flow from specific areas of the mine through a portable flume or weir. The same techniques are used to measure discharges from springs and seeps.

131WQ How it is possible to collect water from the mine and tailings impoundment for pre-operational or post-operational monitoring? (258)

Response: This mitigation requirement has been revised as part of Alternatives 2 and 3. Water from area streams would be used for pre-operational or post-operational monitoring.

132WQ Believes a constant supervision and review must be part of any decision and spelled out. (7)

Response: Appendix B discusses the monitoring which would be implemented under Alternatives 2 and 3. As discussed in a previous comment, additional monitoring would be required under Alternative 3C.

Post-mining Water Quality and Monitoring

133WQ Nothing is said in the EIS about monitoring anything after the mine has closed and the reclamation process is over. (10, 89)

Who will continue to monitor water after mine closure? Monitoring water quality will be an on-going long term activity. If the Evaporator or the Electrocoagulation methods are selected, how will power be supplied to these facilities after mine closure? Who will operate water treatment systems and how will these systems be operated after closure? How much will it cost? Who will handle unanticipated problems/cost? (51, 92, 123, 153, 227)

Will the emergency power generating capacity of the project be increased to keep the impoundment pumps and water treatment equipment operating in the event of power failure? (43)

Noranda's proposal does not address water disposal after the 16-year operation of the impoundment site. Following the closure of the mine who will do the "removing" of embankment seeps? Who will do the pumping of waste water flowing to the surface in springs? Who will maintain and pump the dam stability wells? How long will this process be necessary? How much will it cost? Who will pay for it? (1, 3, 85)

Who will be responsible for inspecting and maintaining the adit plugs to be placed upon cessation of mining activities? Where will the water that flows or seeps from abandoned mine workings go? What will the quality of this water be? If it is toxic or otherwise does not meet water quality standards how will it be treated? Who will perform treatment and how will it be done? (51)

After Year 16, is Noranda committed to continuing treatment of tailings impoundment water for as long as necessary? How will this be done, if they propose to tear down the power line? (121)

How long after year 16 is Noranda committed to monitoring? How will this be enforced? (121)

The quality of the post operations mine water cannot be accurately projected at this time. (130)

Response: Noranda has committed to developing a post-operational monitoring program in cooperation with the agencies prior to mine closure (see *Operational and Post-Operational Monitoring Plans* in the *Alternative 1* section of Chapter 2). Noranda would be responsible for implementing the monitoring program. Stations on Ramsey, Libby and Little Cherry creeks would be monitored. Any adit discharge would be monitored for quality and flow. Ground water levels and quality below the impoundment would be monitored. Additional monitoring locations could be established based on the operational monitoring results.

Noranda would use water inflow data obtained during mining to predict the amount and quality of water expected from the adits. Based on this information, Noranda would consider concrete or other types of adit plugs if it is determined water quality standards would be exceeded. As discussed in the *Ground Water Hydrology* section of Chapter 4, adit plugging is a technique used to control and redirect mine water flow. It does not prevent mine water discharge, however, and it is not a water treatment technique. If post-mining water quality is a concern, plugging, if necessary, would be combined with a water treatment technology. Water treatment technologies currently available for the treatment of mine water discharges include lime treatment, sulfide treatment, evaporation, reverse osmosis, and ion exchange. If water treatment of post-mining discharge would be necessary, Noranda would select a treatment method with review and approval of the agencies.

Noranda proposes a passive seepage collection system, relying on the artesian conditions to provide adequate seepage collection. Pumps would be used if needed. Noranda has indicated the system would remain in place until water quality objectives are met. Chapter 2 has been revised to provide additional information on operation of the seepage collection system after the end of operations (see *Pressure Relief/Seepage Interception System* under *Alternative 1*). Prior to release of Noranda's reclamation bond, applicable surface water quality standards would have to be met. Noranda would be responsible for the operations and maintenance costs associated with any post-operational water treatment.

Power supply requirements of any required treatment or pumping would be evaluated after the appropriate treatment technology has been selected. After operations, either the transmission line would remain in place and supply power, or some other power supply, such as on-site power generation would be evaluated.

Miscellaneous

134WQ The phrase ".. discharged to the percolation pond," should probably read discharged to the land application system. The text consistently refers to percolation ponds, but the land application system may or may not include any percolation ponds. (258)

Response: The term "percolation pond" was used to be consistent with Noranda's permit application (Noranda Minerals Corp., 1989a). In the FEIS, "land application disposal area" is generally substituted for "percolation ponds."

135WQ If human waste is routed to the tailings pond, why won't it appear in the surface water, (due to percolation)? (23)

What are the specifications of the sewage treatment plant? What process will be used? Where will the effluent go? What will be done with the solids? (121)

Response: Treated effluent from the sewage treatment plant would be discharged to the tailings impoundment. The plans and specifications would be submitted to the county and state for review. The amount discharged is expected to be small in comparison to the amount of tailings water discharged to the impoundment. However, it would discharge as tailings seepage into ground and surface water. This discharge may add a small amount of nitrogen compounds to surface and ground water systems. Hydrologic monitoring would include analysis of ammonia, nitrates and nitrites (Appendix B).

136WQ The discussion of water quality doesn't address the water quality problems associated with peak flows when the quantities of water and silt are at least ten fold or more what they are under your analysis. Please show this. (42, 127)

Response: Because of dilution, the potential effects from the project would be considerably less under high flows than at the average and low flows used for the impact assessment. For this reason, it is not necessary to make loading analysis projections at high flows. Noranda's discharges would have an unmeasurable effect on peak flows in Libby Creek. Channel stability during peak flows would not be affected by the project.

137WQ The DEIS fails to point our that "annual periods of low flow" account for over 75% of the water year in Little Cherry Creek, the preferred site for the tailings impoundment site. (86)

Response: Less than average flow conditions in the Libby Creek watershed, when stream flow is derived primarily from ground water discharge rather than from snowmelt or storm runoff, typically occur between July and March, or about 75 percent of the time. The low flow conditions used in the loading analysis to project water quality effects of the proposed operations occur even less frequently. Low flow conditions in the loading analysis are based upon a projected 7-day, 10-year low flow. The 7-day, 10-year low flow is the lowest average flow that occurs for seven days during a ten-year period. Based on measured flows in Granite Creek (see next comment), 7-day, 10-year low flow would occur about 1 to 2 percent of the time.

138WQ We're not sure it was appropriate to use Granite Creek as a comparable stream for drainage area projections. Are soils and vegetative characteristics the same as those found in Libby Creek? Libby Creek is far more developed than Granite Creek, which is largely in the Wilderness. Therefore it is possible peak flows would differ. If Libby Creek's low flows came earlier in the summer than Granite Creek (assuming they are essentially equal in amount), its water temperature might be warmer. That might mean the amount of dissolved metals available in Libby Creek's low flows could be higher than those found in Granite Creek's low flows. (227)

Response: Historic flow records collected by the U.S. Geological Survey at Granite Creek were used to project low and average flow conditions in the project area for use in the loading analysis. These projections require a monitoring station with a long-term record to estimate low flows in project area streams. Granite Creek is 8 miles north of the tailings impoundment. It has similar geology, vegetation, and soils as Ramsey Creek and upper Libby Creek. Other monitoring stations with long-term records are located farther away and are probably less similar to conditions in the project area.

Data from Granite Creek was only used to estimate long-term flow conditions. Ambient water quality for Ramsey, Poorman and Libby creeks used in the loading analysis was based upon samples collected during monitoring in the proposed project area.

139WQ On page 87 [of the SDEIS] the statement that "no cumulative effects are anticipated on Libby Creek from the two mine operations" cannot be true. There is no way that you can disturb some 1,200 acres in a high precipitation headwater area such as this project is located in and not get cumulative impacts. (257)

Response: Under NEPA and MEPA, Noranda's proposed disturbance of 1,200 acres are considered direct impacts. The effects of Noranda's proposed disturbance are presented under Alternative 1 in chapter 4 and summarized in Chapter 5. The ASARCO Rock Creek project would be located in the Rock Creek drainage, which flows into the Clark Fork River. Therefore, there would be no cumulative effects from both mines in the Libby Creek drainage. Cumulative effects would occur from proposed timber sales in the project area. These effects are disclosed under *Cumulative Effects* in each resource area.

140WQ Each of the performance bonds Noranda is required to deliver must be large enough to make it uneconomical for the company to forfeit any of them. Is this the case? (121, 124)

Noranda Minerals' parent company is a foreign corporation. What mechanism will protect downstream interests such as ourselves throughout (a) the life of the tailings impoundment; and (b) as long as water is draining from the mine? (121)

Response: Before issuing a mine permit, the DSL and the KNF would require Noranda to post a reclamation bond to cover the costs of reclaiming the project. A discussion of bonding has been added to the *Department of State Lands* section of Chapter 1. A reclamation performance bond is calculated based on certain standard procedures. The bond amount is intended to be sufficient to ensure proper reclamation if the mine operator should default at any time during operations. If long-term water treatment is necessary, the state would set up a water treatment trust fund. The effects of project shutdown are discussed in the *Socioeconomic* section of Chapter 4. Provisions of the Hard Rock Impact Act (as amended by SB 410 in 1989) require establishment of a Hard Rock Mining Impact Trust Account to mitigate the effects of mine closure or a major workforce reduction.

141WQ How could Libby Creek have been worked for 100 years and still have class B-1 water if this type of activity is harmful to the water. (57, 110)

Response: There could have been impacts at one time from the old workings. However, baseline monitoring indicates that existing water quality is excellent and the B-1 classification is appropriate.

142WQ Why, if the samples were contaminated, were they not discarded and new samples taken? How many samples were contaminated? At what stage in the sampling/testing process? We suggest that the sampling process needs to be repeated, using another clearly disinterested, testing laboratory. (121, 164)

Water quality data is further suspect because: The document admits there have been quality assurance problems. It doesn't specify what the problems were. If one sample was "contaminated, " were others that are considered valid also contaminated? (227)

The EPA has examined Table 6-7 (R) very closely. This table reveals 34 values that are suspect and unusable. The EPA doubts the trustworthiness of the QA/QC program. (229)

Response: The quality control/quality assurance program implemented as part of Noranda's baseline monitoring program identified several quality control problems during sampling. This is the purpose of quality control/quality assurance programs and it is not unusual for such problems to be identified. Nitric acid contamination problems were traced to the use of a nitric acid rinses in the decontamination procedure for field sampling equipment. This contamination occurred during the winter months when proper rinsing was difficult because of the freezing conditions. The problem was eliminated by using deionized water for the decontamination of nutrient sample containers.

Contamination problems also occurred with some of the metals analyses. In most cases the contamination occurred infrequently and did not require correction. However, cadmium contamination was persistent and occurred in all of the surface and ground water samples collected during baseline data collection in 1989. Noranda determined that the presence of cadmium in surface and ground water samples was probably caused by the addition of nitric acid used to preserve the metal samples. The nitric acid apparently leached cadmium from the walls of the plastic ampules used to contain the acid. To remedy the problem, plastic ampules were replaced by glass vials. Cadmium analyses of samples collected during the interim monitoring period (1990, 1991) did not show any quality assurance problems. Although laboratory contamination problems can also occur, the contamination problems identified during Noranda's monitoring were all related to field sampling procedures.

143WQ The discussion of increased stream flow is flawed. The seepage (groundwater recharge) from the impoundment area would occur regardless of whether the impoundment is built. (139)

It is not apparent why analyzed volumes would increase due to discharges from the project. These discharges will result from interception of precipitation and groundwater primarily within the same watershed. (258)

Response: As shown in Figure 2-13, mine water provides the primary source of water for the proposed Montanore Project. Much of this water would ultimately discharge to the tailings pond, and to the percolation pond/land disposal area. Mine and adit discharges would then enter shallow ground water systems which discharge to Libby Creek. A portion of the tailings pond seepage may also originate as precipitation in the tailings pond area. Under ambient conditions, much of the precipitation contributes to streamflow during snowmelt or storm events. As tailings pond seepage, this precipitation also will contribute to low flow conditions.

Ground water in the bedrock system flows along fracture trends toward topographic lows, discharging to high mountain lakes, springs, streams, and unconsolidated valley fill deposits. Ground water in the mine area probably discharges in the Libby Creek, the Rock Creek, and the Bull River watersheds. Mine water inflow would result from the dewatering of ground water storage and from the interception of ground water currently discharging to the Libby Creek, Rock Creek or Bull River watersheds.

The proportion of mine inflow derived from ground water systems currently discharging to Libby Creek is unknown. Since this water is already discharging to Libby Creek, it is not a new discharge, and would not increase streamflow. However, mine water inflow derived from ground water storage and from ground water systems currently discharging to Rock Creek and Bull River would result in water from new sources being discharged to Libby Creek. The analysis of increased stream flow, therefore, presents the upper bound for possible stream flow increase because it includes an unknown amount of ground water already discharging to Libby Creek. The actual increase in Libby Creek streamflow would be an undetermined amount less. The purpose of the streamflow analysis is to assess the potential effect of the mine water discharges on streamflow in Libby Creek. The analysis results show that tailings pond seepage and mine and adit water discharges would not increase streamflow in Libby Creek significantly. The discussion of *Streamflow* in the *Surface Water Hydrology* section of Chapter 4 has been revised to reflect these points.

144WQ Will contaminants in tailings effluent be concentrated by recycling back to the mill? (37)

Response: Some increase in concentrations of various water quality constituents may occur as a result of recycling mill and tailings water. It is not known how much an increase would occur. The expected water quality for tailings, mine and adit waters presented in Table 4-10 are based on the available information from Noranda's Libby Creek adit, ASARCO Troy Mine, and Noranda's bench scale testing.

145WQ What are the specifications of the crusher-to-mill conveyor? How will the creek be protected? (121)

Response: The conveyor would be covered to minimize fugitive dust and would have a secondary containment trough to prevent rock from falling into Ramsey Creek.

146WQ By regulating the actual discharge with source performance standards and a discharge permit much of the need for downstream monitoring is eliminated. It also tells the public that pollution reduction and elimination are the goals of the agencies. (227)

The operating permit that is being prepared for this proposal does not suffice to fulfill the requirements of the Clean Water Act. An MPDES Permit should be required and administered by the WQB. (239, 248)

Response: Under current water quality rules, Noranda is not required to obtain either a MPDES or a ground water permit. Operations receiving a DSL permit are currently exempted from the ground water permitting requirements. Since a direct discharge to surface waters is not proposed, a MPDES permit would not be required. Draft rules under consideration by the DHES would require Noranda to obtain a ground water permit for discharges to the land application disposal area.

147WQ Figure 2-9 shows no diversion ditch to protect Ramsey Creek from slope runoff, spills, etc. Why not? (121)

Response: Surface water from the plant site would be directed to a collection ditch on the south side of the plant site. The water would then flow by gravity to a sediment pond sized to accommodate a 24-hour, 100-year storm event, four hours retention of the thickener overflow, and freeboard (distance from surface of a pond to top of a dam).

AQUATIC & FISHERIES

Impact Assessment—Aquatic Life Standards

1AF Since there are presently no specific standards for aquatic life, it is essential that specific criteria of effect be a part of the permit. (229)

Response: Table 4-22 presents specific standards for aquatic life.

2AF Noranda's data [in the Petition] demonstrate that the state aquatic life standards will be violated. Noranda estimates that cadmium levels will be almost double the state standard. Yet Noranda repeatedly asserts in its Petition that salmonid fishes, aquatic life, waterfowl and furbearers will suffer no adverse effects. However, there is absolutely no data in the Petition to support these assertions. Noranda offers no data on toxicity levels to aquatic and other life. (1, 3, 31, 89)

Response: Noranda's petition has been revised to reflect the management of excess water and the impact assessment discussed in Chapter 4. Under state law, the Montanore Project cannot affect present or reasonably anticipated beneficial water uses, and the Board cannot allow changes that would exceed water quality standards designed to protect beneficial uses. The agencies' preferred Alternative 3C would meet all water quality standards, probably would still require an authorization allowing a change in ambient water quality. The agencies' analysis projects that surface water quality standards for fish and aquatic life for some metals may be exceeded; these projected exceedances, however, are a function of the analytical detection limits used in the analysis and the assumptions used in the analysis. The assumptions used by the agencies are reasonable, conservative, and protective of water quality. The uncertainty associated with the agencies' analysis is discussed in detail in the *Surface Water Quality* section of Chapter 4. The *Fish and Other Aquatic Life* section of Chapter 4 discusses anticipated effects to fish and other aquatic life. The agencies' analysis indicates that surface water standards for other beneficial uses, such as drinking water or irrigation, would not be exceeded under the agencies' preferred Alternative 3C.

3AF Under the discussion of tribal treaty rights the agencies say "no significant effects are anticipated to aquatic life in the project area." How is that? Water quality degradation will occur and some water quality standards will be exceeded. How can the agencies then say aquatic life will not be significantly affected? (227)

Response: The FEIS does not state that water quality standards, designed to protect beneficial uses, would be exceeded. Using assumptions that are reasonable, conservative, and protective of water quality, the agencies' analysis projects under Alternative 3C that some surface water quality standards for metals may be exceeded during low flows. Beneficial uses may or may not be affected by such exceedances, since standards for metals are calculated and not measured.

Impact Assessment—Effects of Sediments

4AF The discussion of fine sediment is simply incorrect. It equates "fine sediment" with gravel and therefore concludes that deposits of fine sediment equals improved conditions for a fishery. Since when? (227)

The floodplain stream channel is already choked with excess bedloads of sediment from bad past practices in the watershed. (257)

There persists in the Supplemental Draft repeated statements that sedimentation is beneficial to the biology of aquatic systems. Our concern is not just with the inaccuracy of these statements, but with the attitude they convey. (250)

Response: The discussion under *Sediment* in the *Fish and Other Aquatic Life* section of Chapter 4 states that "gravels (1/4- to 2-inch diameter) and small-sized particles (less than 1/4-inch in diameter) provide important habitat for fish spawning and for propagation of aquatic insects." To better clarify the intent of this phrase, the section has been revised to rea "gravels (1/4- to 2-inch diameter) provide important habitat for fish spawning, while both gravel and fine sediment (less than 1/4-inch in diameter) can provide important substrate for propagation of aquatic insects." The section also discusses the conditions, extent, and duration where loss of sediment from the project area would likely produce adverse downstream impacts. Additional revision of the discussion about sediments appears in the *Fish and Other Aquatic Life* section of Chapter 4.

For nearly all reaches of Libby Creek assessed during the baseline study, from its headwaters to downstream of its confluence with Hoodoo Creek, sand and silt comprised only from one to seven percent of the total substrate. The single exception occurred through the braided reach of Libby Creek occurring immediately downstream of its confluence with Howard Creek (sample reach L8), where silt and sand comprised between eight and eleven percent of the bottom substrate. There is little evidence that Libby Creek is "choked with excess bedloads of sediment."

The scientific literature discussing the potential value of small gravel and fine sediments in aquatic habitats is cited in the FEIS. The extensive, ongoing scientific research effort directed at understanding the influence of fine sediments on aquatic organisms in flowing water ecosystems shows that much uncertainty exists in understanding these relationships. The discussion presented in the FEIS results from an attempt to draw realistic conclusions from this uncertainty.

5AF Disagrees with statements about spawning habitats. All sedimentation and angular wash would harm spawning habitat in these nursery and recruiting streams. Increases of these kinds would harm benthos and other forms of aquatic life. These assertions are spurious and unscientific. Sediment increases would be laden with toxics, Xanthate plus heavy metals. Toxics reduce survivability of redds, alovins, and fry at any detectable levels. (58)

Response: It is the professional conclusion of the agencies' biologists and their consultants that the statements made in the FEIS regarding sediments are correct. Several potential habitat benefits, including possible increases in available spawning habitat, can result from *limited* increases in *some* types of sediments possibly released to these streams (see publications supporting this conclusion cited in the *Fish and Other Aquatic Life* section of Chapter 4.) In addition, control measures planned as part of mine operations are projected to minimize losses of sediments to these streams. Since control measures are intended to prevent the significant release of sediments to these streams, neither the source of any unplanned release of sediments nor the possibility that toxic chemicals may be contained in or adsorbed upon these sediments can be known or projected.

It is a common misconception that any toxic material present at any detectable concentration poses a threat to life. Several of the heavy metals of concern are essential nutrients to plants and/or animals (e.g., copper, zinc). Laboratory toxicity tests have shown that exposure to potential toxic compounds at concentrations less than their threshold toxicity levels can increase such factors as survival, longevity, growth, and reproductive potentials (e.g., production of fish eggs) in exposed organisms. While not totally understood, this phenomenon is known as "hormesis" or "sufficient challenge." It is thought to result from physiological responses that increase organism fitness as a consequence of the sublethal exposures to potentially lethal stressors, including toxic chemicals. The aquatic life monitoring program described in Appendix B is designed to assess the adequacy and correctness of the agencies' predictions; if unexpected impacts occur, additional mitigation or modification to the mine plan would be required.

6AF Saturation levels will be reached after a few years and the heavy metal contaminants will be creating slikens in the creeks. Water used to irrigate the 140 acre and 170 acre land application sites would be contaminated with toxics. Not only would these heavy metals kill the vegetation on the site but they would after absorbing to the siltites in the percolation process enter Poorman, Ramsey, and Libby Creeks creating slikens of toxics absorbing to the silt in the creek ecosystem, killing benthos and fish. (58)

Response: Slickens and the problems associated with them typically develop when old mine tailings, which contain relatively high concentrations of heavy metals (particularly copper), wash into streams to accumulate in shallow waters and silt flats along streambanks. The control measures planned to limit loss of tailing materials from the project area and the low residual concentrations of metals in these processed tailings make it unlikely that slickens would develop in these streams.

Impact Assessment—Effects of Nutrients

7AF Recent experience with copper/silver mining has changed Stanley Creek and Lake Creek. These creeks were trout streams 10 years ago, today they are over fertilized supporting growths of phytoplankton that are an indication of eutrophication. They no longer support the fisheries they had as natural creeks. (58)

Response: In general, problems associated with eutrophication may occur when total concentrations of phosphorus exceed 0.03 milligrams per liter (mg/L) and nitrogen (including nitrate, nitrite, and ammonia) exceed 0.5 mg/L (Wetzel, R.G., 1975). Commonly, where the most significant eutrophication problems occur, both nutrients can reach concentrations of several milligrams per liter. Under Alternatives 1 and 2, increases in total concentrations of nitrogen are projected to range between 8 and 28 mg/L in Ramsey Creek, particularly during low flow periods (Table 4-14, Table 4-24). Average ambient concentrations of total phosphorus in streams of the Libby Creek drainage range from a high of 0.035 mg/L in Ramsey Creek to 0.005-0.007 mg/L for other stations in Libby Creek and its tributaries (Table 3-14). Concentrations of total phosphorus in waters sampled in drainages from the Libby Creek adit were 0.05 mg/L. As discussed in the *Fish and Other Aquatic Life* section of Chapter 4, these concentrations indicate that discharges of such water would likely produce the strong potential that eutrophic conditions would develop seasonally in reaches of Libby Creek. Nitrogen concentrations under the agencies' preferred Alternative 3C would be below 1 mg/L assuming low nitrate and ammonia concentrations, and less than 1.7 mg/L assuming high nitrate and ammonia concentrations. Alternative 3C would reduce the likelihood that eutrophic conditions would occur.

8AF The discussion of dissolved nitrogen and its effects on algae productivity is speculative and would be enhanced with data collected from Libby Creek just below the percolation ponds used for exploration discharge. Algae populations are reportedly now higher downstream of the percolation ponds than above them. (227)

Response: The *Fish and Other Aquatic Life* section of Chapter 4 includes a revised discussion of nitrogen compounds based on data collected from the Libby Creek adit. Briefly, the growth of algae noted by this comment, which grew downstream from the percolation ponds for the exploratory adit, accompanied elevated nitrogen (>4 mg/L) and phosphorus (~0.05 mg/L) concentrations occurring in Libby Creek and in adit waters. According to a recent MWQB Field Investigation Report, (2/4/92) "this growth was restricted to the right (upstream) margin immediately below a small side channel." The algal growth reported was not representative of Libby Creek near the adit percolation pond area.

Algal species in samples collected from this growth were identified by MWQB personnel as including taxa most commonly associated with highly eutrophic surface waters. If such growth become excessive and undesirable algal growths occur, adverse impacts to aquatic life or other beneficial uses may occur.

9AF The document says dissolved nitrogen is projected to increase substantially over background concentrations during periods of low flows. None of the loading calculations tables project nitrate levels at 4 mg/1. Where does this number come from? (227)

Response: The discussion of nitrogen in the *Fish and Other Aquatic Life* section in the SDEIS referring to 4 mg/L of dissolved nitrogen was in error. The nitrogen discussion in the *Fish and Other Aquatic Life* section of Chapter 4 has been revised to reflect additional information on nitrate concentrations in adit discharge.

Impact Assessment—Effects of Metals

10AF Statement that increases in nutrients would increase productivity of the aquatic community and growth rates for fish is misleading. On land nitrates act as a fertilizer, but in the aquatic ecosystem nitrates act as a poison, what about the constituents copper, silver, cadmium and lead? Is Noranda pretending that these heavy metals will enhance the ecosystem for fish or macroinvertebrates? These statements are inaccurate, all mining activity would increase the acidic level lowering pH and stressing the system. Most of these elements are extremely toxic. (58)

These waters tend to be on the low side of neutral. Increases in acid or metal will compound this problem for fisheries. These creeks are nurseries. (58)

Response: Productivity and low biomass of aquatic insects probably limits fish production in the Libby Creek system; increasing nutrient concentration could increase this productivity. Phosphate and nitrate are the two major nutrients upon which plant growth in streams and lakes depend. The author of this comment may be confusing "nitrate" with "nitrite," which has been found to be toxic to some aquatic life, including rainbow trout.

In surface waters, nitrite is rapidly converted to nitrate. The EPA Quality Criteria for Water 1986 specifies only that nitrate be less than 10 mg/L to protect domestic water supplies, since greater concentrations may lead to formation of nitrite in the gut and potential nitrate poisoning in children. The EPA also notes that concentrations of nitrate potentially toxic to aquatic life "would be unlikely to occur in natural surface waters." The FEIS states that increases in "many minerals (e.g., calcium, potassium, etc.) probably would increase productivity of the aquatic community and growth rate for fish." This statement specifically relates to mineral macro- and micronutrients, such as the two listed, not toxic concentrations of heavy metal minerals as suggested by the submitted comment. Increased dissolved calcium concentrations, in particular, can substantially help to reduce potential impacts by acids and many heavy metals in soft waters. Calcium can bind to gills of fish, reducing loss of body ions and out-competing many heavy metals for binding sites on gill tissues. Also, increased dissolved concentrations of calcium in soft waters can benefit many ion regulation and growth processes in most aquatic animals.

The discussion concerning metals in the *Fish and Other Aquatic Life* section has been revised to reflect the uncertainty associated with metals toxicity. The monitoring plan for aquatic life presented in Appendix B included methods for monitoring and assessing potential impacts before, during, and after mine operations.

11AF Fish are known to acclimate to much higher levels of metals than are predicted for Libby Creek and apparently survive in streams traversing other mineralized areas in the Libby area. (139)

Response: Knowledge about the acclimation of fish to metals primarily originates from studies conducted in waters having considerably greater hardnesses than those found in the Libby Creek drainage. While fish do inhabit portions of Libby Creek traversing other mineralized areas, it is not known empirically whether the metals concentrations contribute to the low population densities of fish occurring in Libby Creek.

Impact Assessment—Sensitive Species

12AF The discussion on sculpins is unclear. (227)

The EPA raises concern about potential effects on threatened and endangered or otherwise uncommon or sensitive fish species and their populations. Since torrent sculpin is listed as imperiled by the Montana Natural Heritage Program and sensitive by the Kootenai National Forest, what special measures are being taken to protect these fish? What is the size of their populations in affected streams? What particular sensitivities to water quality and habitat alteration do these fish have that other species may not? (229, 243)

Response: The discussion in the *Fish and Other Aquatic Life* sections of Chapter 4 concerning sculpin has been revised. Samples of sculpin collected from Libby Creek and its tributaries by the KNF fishery biologist during 1991 revealed that 100 percent of the sculpin collected from the project area were slimy sculpin (not a sensitive species). Torrent sculpin were collected from reaches of Libby Creek near U.S. 2 and downstream; no torrent sculpin were collected from waters nearer the project area. The only known data on which relative sensitivity of sculpin to metal pollutants can be evaluated appears in EPA's 1987 draft "Ambient Aquatic Life Water Quality Criteria for Silver" (Environmental Protection Agency. 1987. Ambient aquatic life water quality for silver--draft. U.S. EPA, Office of Research and Development, Environmental Research Laboratory, Duluth, MN. pp. 47-48.). This document shows the results from acute toxicity tests using mottled sculpin (*Cottus hairdi*) exposed to silver. Relative to other freshwater aquatic species tested, sculpin ranked 7th in sensitivity (genus mean sensitivity = 8.4 µg/L). For comparison, Daphnia ranked 1st (2.2 µg/L), *Ceriodaphnia* ranked 3rd (3.9 µg/L), fathead minnows ranked 9th (11.3 µg/L), and rainbow trout ranked 11th (13.4 µg/L). That is, the two invertebrate species proposed for testing in Noranda's monitoring program ranked more sensitive than the fish. The three fish species proposed for toxicity testing in Noranda's monitoring program had relatively similar magnitudes of sensitivities to sculpins. In addition, recent research on the comparative sensitivity of taxa and the ability to extrapolate toxicity results across taxonomic groups concluded, "...most extrapolations between taxa within the same family can be made with fair certainty..." (Barnthouse, L.W. et al. 1986). In other words, these results obtained for mottled sculpin should be reasonably representative of results that should be expected from other sculpin. Further, results from toxicity tests with most metals generally show that invertebrates are relatively more sensitive than fish, and that fathead minnows are generally more sensitive than trout species.

The proposed aquatic monitoring plan for this mine (1) would occur upstream from areas inhabited by populations of torrent sculpin and nearer sources of potential impacts, (2) would include invertebrate species that are generally more sensitive to metal toxicity than fish, and (3) would include fish species that have relatively similar sensitivities to sculpin. The agencies anticipate that potential causes of impacts to populations of torrent sculpins would be detected through the monitoring prior to the occurrence of any long-term impact on these populations.

The reason for the special classification of the torrent sculpins is that they occur only in streams of the Kootenai River watershed. In many streams within this watershed, individuals of this species are relatively common. Also, field observations indicate that torrent sculpin have habitat requirements (e.g., sensitivities to fine sediment) very similar to those for trout, the fish species that most commonly share their habitat.

13AF The problem of reestablishing a viable fisheries in the Clark Fork River continues to perplex the experts. (58)

Response: Control measures for the Montanore Project are projected to minimize or eliminate impacts to area streams. Also, the aquatic life monitoring program is intended to reveal whether any unexpected impact occurs, and it provides options for implementing appropriate corrective actions if significant adverse impact occurs. With these protective measures, there should be no need to reestablish fisheries. Thus, problems such as found in the Clark Fork River should not occur in Libby Creek.

14AF Larger fish are downstream and the observation that there are not many catchable trout is not a very accurate interpretation of the population dynamics in high mountain streams. When spawning and nursery waters are polluted the entire fisheries downstream is destroyed. The background levels of toxic heavy metals is not limiting population or size. The bigger fish simply go downstream to better hunting and the fry and fingerlings are the only fish you see. (58)

Response: Data on fish populations and spawning activities collected by the Montana Department of Fish, Wildlife, and Parks and contained as a part of Noranda's permit application are presented in the *Fisheries* section of Chapter 3. No larger fish were found. Two spawning redds for bull trout, which had apparently migrated from the Kootenai River, were observed during 1989 in Libby Creek downstream of the project area streams; no spawning redds were found in streams within the project area.

Bull trout were captured during sampling conducted by the KNF in 1991. These trout probably were resident trout rather than migratory trout from the Kootenai River. The bull trout found in the project area are a resident population with small (<6 inch) reproducing adults. There is little evidence to indicate that these fish are juveniles of a Kootenai River migratory population.

15AF There are several sensitive fish species which are known to occupy waters in the Project Area and adjacent waters downstream, although their existence is barely acknowledged in the DEIS. Bull trout is currently under a Notice of Review, given minimal consideration in the DEIS, despite its need for critical habitat which would be destroyed by the Montanore Project. (86)

Response: The presence of bull trout and other sensitive fish species is discussed in the *Fisheries* section of Chapter 3. In addition, all sensitive species, including fish, are discussed in a *Biological Evaluation for Fish Species* available at the KNF.

16AF Disagrees with statements about aquatic insects. The conclusion is drawn that the low densities are responsible for the lack of catchable trout. These are high densities and the conclusion is incorrect. (58)

Response: The density of aquatic insects in Rocky Mountain streams is reported in the literature to range from several hundred to 20,000 or more per square meter of benthic substrate (Platts, W.S., W.F. Megahan, and G.W. Minshall. 1983.). While no judgement is made in this section about the relative density of insects in the Libby Creek system, the reported density of 1,800 to 2,500 organisms per square meter is on the lower end of this range. Potentially more important than the relative densities of insects is the quantity of insect biomass available in the stream that can provide food for fish. The agencies assume this comment concerns a statement on page 120 of the DEIS : "Using U.S. Forest Service (1985) criteria based on macroinvertebrate biomass, the potential to support fisheries in all project area stream reaches is rated as poor." These criteria rank aquatics invertebrate biomasses of 0.0 to 0.5 grams per square meter (g/m^2) as "poor, " 0.6 to 1.5 g/m^2 as "fair, " 1.6 to 4.0 at "good, " and 4.1 to 12.0 g/m^2 as "excellent." The 0.03 to 0.42 g/m^2 of average dry weight aquatic invertebrate biomass found in project area streams warrants ranking as having a "poor" potential to support fish. The relatively low population numbers, biomasses, and condition factors for fish collected from the Libby Creek system also provide independent confirmation of low invertebrate, food-organism productivity in the Libby Creek watershed.

Monitoring

17AF Noranda is in agreement with the agencies that a biomonitoring program should be implemented for the Montanore Mine Project. Our major concern is that the objective of the biomonitoring program, as it is presented in Appendix B, is unclear. Objective is vague and needs clarification prior to final program development. Biomonitoring program must have a specific objective and procedures and analyses focused on that objective. (139)

Response: Appendix B has been revised to present objectives of the monitoring programs.

18AF A rigorous QA/QC program should be a part of the testing. (229)

Response: The section on quality control in Appendix B stresses the importance of a strong QA/QC program as part of all monitoring activities for this project.

19AF Agrees that 50 percent deviations for biological parameters might not be very conclusive. Suggest that the biological monitoring include a trend analysis, instead of waiting for large-scale deviations. (227)

All biologic monitoring plans should include quantitative and qualitative standards that would trigger changes in mining operations. (227)

Response: Limitation with the approach of setting quantitative limits as part of the monitoring plan are discussed in the section *Biological Monitoring Objects and Review Criteria for Impact* in Appendix B. In addition, standards are established by administrative action, not in an EIS.

Trend analyses was included as a possible approach for analyzing data, as discussed in the *Aquatic Life* section of Appendix B. It is important to note, however, that use of trend analysis techniques, including the most commonly recommended procedures for analyzing between-year trends in seasonal data (i.e., analysis of covariance or seasonal Kendall tests), do not preclude the need for "waiting for large-scale deviations" in monitored parameters to occur before statistically significant impacts may appear. In particular, when there is considerable variation in the data, such as occurs when there are naturally variable episodic events such as high energy rain-on-snow runoff events, highly variable population numbers occur (e.g, from near zero to some number considerably higher). Data sets of 20 to 30 years or more may be required to establish natural background conditions for the model before accurate identification of significant "impacts" may be detected. Trend analyses, like all correlation analyses techniques, reveal only the existence of relationships in the data; they do not reveal the cause of any such new deviations. While use of trend analyses may provide a useful tool in analyzing data from the Montanore Project, this technique holds no inherent advantages over other methods at this time.

20AF Recommends more than one qualitative benthic sample be taken each sampling visit. This will improve the sensitivity of the monitoring. (227)

Caution against the message that measuring future impacts may not be possible. While frequent flushing events do destabilize the fauna of Libby Creek, the community structure present there is relatively stable and capable of indicating impacts in a reliable way. (250)

Response: As stated in the *Aquatic Life* section of Appendix B, the qualitative sample would be collected from a diversity of "habitats not sampled during collection of the quantitative samples." Adding additional qualitative samples would only duplicate the planned effort, not necessarily enhance it.

The FEIS does not state that measuring impacts may not be possible. It states that using statistical methods to define "average" reference conditions has limited value and, consequently, use of many conventional statistics would not be able to "produce meaningful judgements of significant differences...." It would be Noranda's responsibility to propose and document, and the responsibility of the regulating agencies to approve, appropriate data analyses procedures useful for analyzing results from monitoring studies for this project.

21AF It is important that any taxonomic group that is selected be justified as to why that group is being used and how the information will be used. This will help prevent the problem of collecting a large volume of data for which no use can be determined. Noranda questions the use of periphyton sampling. (139)

Response: The aquatic biological monitoring plan in Appendix B has been revised to indicate that periphyton includes many important algal species useful for identifying the nature and extent of pollution impacts. Also, periphyton include some of the first species to colonize stream communities following extreme high-water runoff events that destroy or flush many resident fish and benthic invertebrates downstream—such events are common in the Libby Creek watershed. Periphyton biomonitoring would help assure the continued availability of appropriate organisms to assess potential aquatic impacts from this project. In addition, the other monitoring efforts would focus on animal taxa, periphyton monitoring would provide the only information from plants. Since plants can respond to impacts differently than animals, periphyton monitoring can detect adverse water quality changes not detected by other monitoring efforts. Because periphyton growth and reproduction rates are the most rapid of the monitored taxa, these organisms often will be the first to reveal effects from many potential impacts.

22AF The proposed biomonitoring program suggests collecting five benthos samples at each station. The selection of this number appears to be somewhat subjective. As a preliminary step to the monitoring program implementation, the natural variability of benthic macroinvertebrates in the Libby Creek drainage should be evaluated using the baseline data and any other data that are available. The level of replication should be selected based on the natural variability. (139)

Response: Biological monitoring methods for benthic insects presented in Appendix B have been revised to require that appropriate sample numbers be established by conducting separate analysis at each site for each seasonal sampling period. Preliminary evaluation by the agencies of baseline data indicates that five or fewer benthic samples may be adequate for some sites, while 10 to 15 samples maybe needed for other sites.

23AF For the analysis of the aquatic insect data for each station, there is no discussion as to how these various measures will be used, for example to establish differences in the metrics among stations or among sampling periods. (139)

Response: The various metrics for analysis of the aquatic insect data listed in the DEIS are those suggested by Noranda in their draft study plan. Revisions to Appendix B biological monitoring methods address specific application of these measures.

24AF Fish should be collected in upper Libby and Ramsey Creeks, as well as in the mainstream of Libby Creek between L-1 and L-3. This brings the monitoring closer to the source of the pollution. Fish should be sampled immediately below the natural confluence of Little Cherry and Libby Creeks so that the immediate effects of the impoundment can be better determined. (227)

Response: Locations and methods for fish population monitoring have been selected to minimize potential impacts attributable to monitoring on these populations. These locations and methods are expected to provide a reasonable degree of safety and adequate margin of advanced warning with respect to possible impacts from the Montanore Project on fish and other aquatic resources in the Libby Creek system and downstream.

25AF Sampling procedures should also address alternative procedures that will not injure the fish. (258)

Response: Fish sampling would be completed by or under the direction of personnel from the Montana Department of Fish, Wildlife, and Parks. The methods used would be those that are most able to provide good data with minimum injury or mortality to the surveyed fish populations.

26AF Could chronic toxicity tests with *Ceriodaphnia* be incorporated into the monitoring plan? EPA may be able to identify and recommend other bioassay or toxicity tests that would be appropriate for the very soft waters existing at the mine site. (85)

Response: Tests using *Ceriodaphnia* were originally included in the aquatic life biomonitoring program presented in Appendix B of the DEIS and continue to be suggested as a monitoring option in the FEIS. Laboratory personnel designing and conducting the biomonitoring studies for this project would be encouraged to contact appropriate EPA personnel for assistance in developing appropriate procedures and for selecting appropriate strains of test organisms.

27AF The EPA is pleased that whole effluent toxicity testing of ambient and mine-related waters is proposed, however there are a number of concerns that need to be considered in the WET testing. Water for testing should be collected when the concentration of potentially toxic materials are highest. This may or may not be August. (229)

Response: Revisions to the aquatic toxicity testing program in Appendix B include the stipulation that testing would be conducted "during periods of low flow in Libby Creek, generally during August or September."

28AF The EPA has concerns about working with early life stages of trout alone, since the most sensitive stages to metal toxicity may be at stages when any handling causes mortality. They recommend that fathead minnows of known age be used in addition to the trout. They recognize the concerns over low ionic waters on test species and suggest that a meeting be held with their bioassay personnel to work out an acceptable protocol. (229)

Response: Appendix B includes fathead minnows of known age as a fish species to be included in, at least, the initial toxicity testing.

29AF The EPA feels it is not satisfactory to omit further testing "after a satisfactory relationship has been defined." There is no assurance that holding pond and mine waste pond water will not change during the life of the project. The use of forced evaporation may well increase concentrations over time, and the mine water itself may change as different strata and water sources are encountered. (229)

Response: In Appendix B, the agencies suggest that "when successful invertebrate testing procedures are assured, joint tests using fish and invertebrate species could help to establish the toxicity-response relationship between these species in these test waters. After satisfactory relationships have been defined, the toxicity tests using fish may be omitted as a future monitoring requirement." Tests using invertebrates would continue. The FEIS states that, after a satisfactory relationship has been defined, future monitoring should focus on tests using the most sensitive species found to give reliable results.

30AF The selection of bioassay organisms is critical because it is important to use species that are representative of biota endemic to the area in question. The bioassays selected need to be explored in more detail to assure that the tests are the most suitable for conditions in the Libby Creek drainage and that they meet the objectives of the monitoring plan. (139)

Response: The agencies agree with this concern, as the revisions to biomonitoring requirements in Appendix B show.

31AF It is unclear from the DEIS how the bioaccumulation study will serve as an indicator of ecological effects. There are very few reliable data which correlate tissue levels of metals with deleterious physiological effects in fish. Trends in concentrations of metals in fish tissue in the Libby Creek system will give very little, if any, meaningful data to use in monitoring ecological impacts upon the system due to mining activities at the Libby Creek site. The objectives of a fish tissue assay program need to be defined; is it a human health issue or an environmental impact issue? (139)

Response: It is not true that bioaccumulation trends for metals in fish provide data of little or no use in impact assessment. Considerable new information, although most is currently unpublished, strongly indicates that fish health can be related to tissue concentrations of potentially toxic chemicals, including metals (Dr. Rodney Johnson, U.S. EPA ERL-Duluth, and Dr. Harold Bergman, University of Wyoming, personal communications w/ M. Marcus, IMS). Considering that most fish naturally contain no measurable concentrations of lead or mercury, *any* trend showing increased accumulation of these metals in fish causes increasing concern about the health of the affected fish population and, potentially, the ecosystem. Trends of increasing metal concentrations in fish also cause increasing concerns about potential impacts to wildlife and human consumers of these fish. U.S. Food and Drug Administration standards require that mercury concentrations in flesh for human consumption not exceed one microgram per gram. Also, lead and mercury, the two metals proposed for bioaccumulation monitoring for the Montanore Project, are two of only four metals ranked by the U.S. Fish and Wildlife Service as having "high" concern to terrestrial wildlife when present in the aquatic environment (U.S. EPA, 1989). Any trend showing increased metal bioaccumulation in fish indicates that potential beneficial uses of the resources in Libby Creek are at increased risk of potential adverse impact.

32AF Because the trout population is small and consists mainly of smaller size fish in the streams, using trout for the tissue analysis may significantly reduce the trout population. Sampling every other year or every third year may be adequate to indicate long term trends and to document any changes in metals bioaccumulation while imposing a lesser impact on fish populations. (139)

Response: Removing 10 trout per year from the Libby Creek system would not cause short-term, long-term, or irreversible impacts to fish populations in the Libby Creek system. Biennial (every other year) data on bioaccumulation of lead and mercury would provide needed data for assessing possible trend of change and year-to-year variability for lead and mercury concentrations in fish.

33AF Recommend the additional fish monitoring suggested by the agencies be adopted. Also recommend, if possible, that cutthroat trout be collected for bioaccumulation because of their higher sensitivity to metals. (227)

Response: Based on 1991 sampling conducted by the KNF, cutthroat are extremely rare, and redbands and redband hybrids predominate. Cutthroats cannot be sampled because of the small population size and the sensitive status of the species. Cutthroat hybrids would be sampled as long as it takes to develop a correlation with slimy sculpin.

34AF The DEIS fails to address the fact that copper and zinc are synergistically toxic to fish. While projected concentrations of each may be within acceptable limits by themselves, what is the toxicity of the two metals together? Given the presence of both copper/silver ore and galena, this is a very important issue. (121, 161)

Response: Laboratory studies have shown that copper and zinc can have either additive or synergistic responses in acute toxicity studies. But, synergistic relations between these two metals have not been shown either in chronic toxicity tests in the laboratory or in field studies. In addition, laboratory and field exposure studies show that fish can acclimate to copper, zinc, and other metals, increasing their tolerance to potentially lethal concentrations. EPA's 1991, "Technical Support Document for Water Quality-based Toxics Control" (EPA/505/2-90-001, page 24) states that "..field studies of effluent toxicity and laboratory experiments with specific chemicals imply that synergism would be an extremely rare phenomenon. It has not been observed during on-site effluent toxicity studies, and is not considered an important factor in the toxicological assessment of effluents."

35AF Studies should be required to assess how fish in soft waters are impacted by the concentration of metals expected and appropriate stipulations included in any permits to halt work should these studies indicate such a need. (171)

Response: The aquatic life monitoring program in Appendix B includes requirements for pre-operational and operational toxicity tests using area waters, and includes options for modifying or limiting mine operations.

36AF Proposed biomonitoring program combines methods that appear to address both impacts and compliance. Monitoring water quality and fish tissue (Hg and Pb) are typically used for compliance; whereas monitoring periphyton and macroinvertebrate community structure are typically used for determining impacts. Bioassays are used for both impact and compliance. (139)

Response: It is true that many of the aquatic biological monitoring methods may be used for either impact or compliance assessment. The program is designed to evaluate the extent of both projected and unforeseen impacts due to the proposed project. Also of concern are potential impacts to any designated beneficial uses. The revised monitoring plan in Appendix B provides additional detail on the intent and application of each parameter to be monitored.

37AF Cobble embeddedness is not a good system for determining increases in fine sediment in substrates in small streams. Recommend a modified square grid method (see Lolo Forest's recent monitoring program) be used. (227)

Response: The final paragraph of the discussion about *Fine Sediment* monitoring in Appendix B of the SDEIS did stipulate use of Lolo Forest's square grid method. The same requirement is found in the FEIS.

Fisheries Mitigation

38AF It is unclear to the EPA why fisheries habitat components cannot be better incorporated into the diversion channel design. Why must the diversion channel bypass flows around the lower segment of Little Cherry Creek and a segment of Libby Creek, significantly reducing water flows in these segments? The EPA also asks for an expanded discussion of channel capacity and stability in the unnamed drainage of Libby Creek into which Little Cherry Creek diversion flows will be directed. (229)

Response: The proposed diversion channel with associated diversion dam would route the Little Cherry Creek flow away from the tailings impoundment, discharging to an unnamed tributary of Libby Creek. Little Cherry Creek below the tailings impoundment would therefore no longer receive surface flows from the watershed above the diversion dam. The diversion channel is sized for the runoff volume associated with the 6-hour Probable Maximum Flood (PMF), and includes rock riprap slope protection against the 100-year, 24-hour storm runoff. Within the main channel, a secondary "normal flow" channel designed to contain the average annual high flow (of Little Cherry Creek) would be constructed. Depending on the flow conditions, Noranda anticipates that the channel might permit fish migration.

The proposed diversion channel design would include the following components to aid in the development of fisheries habitat—

- creation of shallow water zones less than three feet deep;
- creation of herbaceous emergent wetlands and undulations to form pools during low flows;
- evaluation of surface water losses to groundwater through the channel floor and implementation of procedures to reduce such losses if necessary;
- salvaging of wetland soils from the impoundment area and placement within the diversion channel;
- placement of a layer of soils and smaller-sized rock over larger riprap in order to reduce soil infiltration and provide a more suitable rooting substrate; and
- construction of down-drainage flow barriers for dissipation of flow energy and creation of pools.

Figure 2-12 indicates that roughly an additional 6,500 feet of diversion channel would be required to route the diverted flows back into the existing Little Cherry Creek drainage downstream of the seepage collection dam, and would include a crossing of the unnamed tributary to Libby Creek that is discussed above. This would increase the total channel length to in excess of 11,000 feet and involve approximately 2.5 million cubic yards of additional excavation. Construction of a secondary channel within an extended main channel, sized for the high average annual flow, would permit the extended diversion channel to restore flows to the lower segment of Little Cherry Creek and a segment of Libby Creek.

At present, information concerning the flow capacity (cross-section, slope and condition), and anticipated stability of the unnamed tributary into which the diversion channel would discharge, is not available beyond that presented in the FEIS. It should be noted, however, that proposed mitigation part of Alternatives 2 and 3 include the design and construction of a channel (within the unnamed tributary) providing adequate erosion protection against anticipated flows and extending from the outlet of the diversion channel to the entrance to Libby Creek.

39AF The proposed tailings impoundment and diversion channel will result in the loss of 5,500 feet of stream habitat in Little Cherry Creek and Libby Creek. It does not appear to the EPA that improving spawning habitat in Howard Creek and introducing rainbow or cutthroat trout into Midas Creek will adequately mitigate these fishery and stream habitat losses. Also the fish passage problem in Midas Creek should be discussed further in relation to the probable success of fisheries mitigation in Midas Creek. (229)

The EPA feels strongly that Noranda should work closely with the Kalispell Regional MDFWP fisheries staff to develop an improved fisheries mitigation plan. (229)

Response: The fishery mitigation plan has been revised and is presented in more detail in the FEIS. The seasonal high flows that occur in the Libby Creek watershed, coupled with the low nutrient status, provide poor fish habitat and make development of an on-site fisheries mitigation program difficult. The fisheries mitigation plan presented in the FEIS has been developed through consultation with the Kalispell Regional MDFWP fisheries staff. It is the agencies' opinion that the plan provides adequate mitigation.

40AF Noranda has proposed to mitigate impacts to Little Cherry Creek in part through enhancements to Midas and Howard Creeks. Noranda ignores the fact that significant downstream portions of these creeks are located on private land owned by LPMC. The agencies must ignore these proposed mitigation measures and require Noranda to develop alternative measures to mitigate the loss of the Little Cherry Creek fisheries. (201)

Response: This comment simplifies the mixed private and public ownership of lands surrounding Midas and Howard creeks. A revised mitigation plan is included in the FEIS. Mitigation would occur on public lands.

41AF Commenter does not like the idea of changing Howard Creek in any way, nor does he think that changing Midas Creek is appropriate. You are mitigating for a fish population that does not exist. If there is data that indicated there is fish population in Libby Creek or Midas Creek, commenter would like to see it! (256)

The projected "loss" of 330 trout is not documented or explained. If Little Cherry Creek is a nursery fishery then it may be possible for some of the small trout that utilize Little Cherry Creek to occupy other habitat. (258)

Response: KNF records indicate that Midas Creek holds fish species and densities similar to those fish populations occupying Ramsey and Poorman creeks, except that the fish inhabiting Midas Creek tend toward the smaller size of the ranges found in the other two creeks. The revised *Fish and Other Aquatic Life* section of Chapter 4 includes additional documentation on how the estimated losses of fisheries from Little Cherry Creek were computed.

42AF No discussion of how the diversion, as proposed, will satisfy the existing use protection requirement of Montana's nondegradation rule. (85, 123)

Response: It is the Montana Department of Health and Environmental Sciences' position that beneficial use under the nondegradation rule is protected only from changes in water quality or changes in attributes affected by water quality. Protection of use is not accorded by the nondegradation rules in circumstances where changes are due to habitat modification.

43AF The information collected for fisheries was apparently the result of one season's data collection—again it occurred during 1988, one of the worst drought years this century when fish dispersal may have been more an anomaly than "normal." (130)

Response: Noranda has conducted interim monitoring every year since 1988. This information was included in the analysis in the Final EIS.

FLOODPLAINS

1FP Nonresidential construction which can be damaged by flood water should be placed above or flood-proofed to above the 100 year flood water surface elevation and should be designed to minimize potential harm to or within the flood plain. (180)

If the operation of the constructed facilities is considered critical during flood periods, the facilities should be protected from the 500-year flood. (180)

Flood plain construction should not increase the water surface elevation of the 100-year flood more than one foot relative to existing conditions. (180)

Flood-related problems should not occur if the supporting structures for overhead powerlines are located as far from the banks of the drainageways and streams as possible to minimize the potential for erosion hazards and floodflow obstruction. (180)

Flood-related problems should not occur with underground powerlines if the lines are buried far enough below the beds of drainageways and streams to prevent exposure due to streambed erosion during periods of high floodflows. (180)

Flood-related problems should not occur if any above-ground construction subject to flood damage, such as electrical boxes, is either placed above or flood-proofed to above at least the 100-year flood elevation. (180)

Response: Floodplains are discussed under *Floodplains* in the *Surface Water Hydrology* section of Chapter 4. Table 4-7 indicates the number of transmission line poles that could be located within a designated 100-year floodplain. It would not be practical to completely avoid crossing floodplains by the transmission line. No underground construction of transmission line facilities is proposed or recommended due to greater environmental effects and costs. Given these considerations, design, construction and operation of the proposed transmission line would be done under prudent utility practices required by the National Electric Safety Code and pursuant to local flood regulations. The agencies believe that these requirements, discussed in Appendix F, *Environmental Specifications for the 230-kV Transmission Line*, would provide the necessary protection to safely operate the proposed transmission line and substations. If the U.S. Army Corps of Engineers believes that additional requirements are necessary, these measures could be incorporated as conditions to the required 404 permit approval.

WETLANDS

Wetlands Identification

1WE If construction activities involve the temporary or permanent placement of dredged or fill material into waterways of the United States, a Section 404 permit may be required. (180)

Disturbance and elimination of 76 acres of wetlands does require a section 404 permit. Noranda should be required to apply to the Corps of Engineers for a wetlands permit under section 404 of the Clean Water Act. (2)

Response: Chapter 1 indicates a Section 404 permit from the U.S. Army Corps of Engineers would be required. The Montanore Project would affect about 14 acres of wetlands and 5.8 acres of waters of the United States (see *Wetlands and Waters of the United States* section in Chapter 4).

2WE Wetlands should be described fully in the EIS and their locations shown on maps. (171)

Page 64 [of the DEIS], other wetlands are implied. Where are they? (121)

The loss of wetlands habitat cannot be mitigated due to the environmental impact of the tailings dam. (2)

Construction of the tailings dam would destroy wetlands. Any wetlands within the impoundment area will necessarily be destroyed. (2, 85)

Noranda has notified the Army Corps of Engineers that the construction of the tailings impoundment site will eliminate 0.9 acres of wetlands, however Noranda's own data demonstrate that Noranda has been somewhat less candid with the Corps of Engineers. In reality the construction of the impoundment site will destroy over 76 acres of wetlands. (2)

Pg 220 [of the DEIS]- states that 3 acres of wetlands occur and Chapter 3. Pg. 134 [of the DEIS] states that 5 acres occur. (139)

0.9 acres of wetland [discussed in the DEIS] seems very conservative figure, given the size and location of the impoundment. Has the wetland been surveyed by anyone beside Noranda? (121)

Not all areas within the permit are will have disturbances. All but two are outside permit boundary. (154)

Response: These comments address the agencies' wetlands analysis documented in the DEIS. In response to these comments, Noranda conducted additional wetlands surveys and developed a wetlands mitigation plan. This information was provided in the SDEIS. Additional wetlands mitigation information is presented in Chapters 2 and 4.

3WE Noranda recommends that the Agencies clarify that the wetlands survey and delineation were performed following methods consistent with the 1987 Manual. (258)

Response: Chapter 6 has been revised to clarify that the delineated jurisdictional wetlands discussed in Chapter 3 were mapped following methods consistent with the 1987 Manual.

4WE Noranda has limited its mapping effort to the Little Cherry Creek tailings impoundment area. Apparently, no effort has been made to map wetlands in other areas within the project. (202)

Response: The discussion of wetlands baseline data collection in Chapter 6 states all potentially affected areas in the mine area, access road, and selected areas along the transmission line corridors were mapped for wetlands. Wetlands mapped in accordance with the 1987 Manual were limited to the Little Cherry Creek tailings impoundment area. The agencies and their consultants field reviewed the mapping.

5WE The SDEIS implies that because the wetlands are small and not fed by significant drainage basins that the value of their functions to the region is limited. These small wetlands are responsible for a great deal of biodiversity, and because they are such fertile ecosystems, they are able to produce much more biomass acre for acre than any other ecosystem in the Forest. It is this biomass produced, whether plant, invertebrate or vertebrate, that makes these wetlands 'grocery stores' from which most creatures of the forest can directly or ultimately derive benefit. (225)

Response: The reference to size and the limited value of functions to the region refers to functions that are related to the wetland area relative to drainage basin area (e.g., flood storage and attenuation, sediment trapping and nutrient removal). The value of the hydrologic related functions is related to the ratio of wetland area to drainage basin area. The statement was not intended to underestimate the values of the wetlands to wildlife and the biodiversity of the region.

6WE Please recognize that there is considerable disagreement between political and the scientific communities as to the protection which needs to be afforded wetlands. We anticipate future revisions to current wetlands policy. (225)

Response: The agencies recognize that there is considerable disagreement between political and the scientific communities as to what constitutes a wetlands as well as to what protection needs to be afforded wetlands. Current direction from the U.S. Army Corps of Engineers is to use the 1987 wetlands manual to identify wetlands.

Alternatives to Avoid Wetlands

7WE The Little Cherry site was apparently selected because of the absence of artesian conditions. The statement that artesian conditions do not occur at the Little Cherry site is clearly fallacious. Morrison-Knutson determined that that artesian groundwater conditions were found in both the Poorman site and Little Cherry site. They reported that at the Poorman site the artesian pressures were higher than at Little Cherry site. (17 feet) However, in its Interim Geotechnical Report prepared in December, 1989, Morrison-Knutson reported artesian pressures at the Little Cherry site that were well above those found at the Poorman site. (Pressure heads as high as 22 feet above the ground surface were measured) US Borax, Noranda's predecessor-in interest, had directed Morrison-Kuntson to pay special attention to the Standard Cr. and Midas Cr. sites, since they appeared to be the most favorable sites. Noranda has failed to select the least environmentally damaging alternative. At a minimum the Poorman, Standard, and Midas Cr. sites should be re-examined for their suitability. They could not possibly be found less suitable than the Little Cherry site. (2, 51, 52, 86)

The Draft states that the Midas Creek site was rejected because it required two diversion channels that were susceptible to obstruction. Morrison-Knutson provided a solution to this problem. They state that dual diversion channels could be avoided by constructing spill ways to drain accumulated water from the impoundment surface. Sufficiently large spillways would not be subject to obstruction. (52)

There is no evidence of artesian conditions at the Midas Creek site. There would be no need for the installation of pressure relief wells. There would be no concern over dam failure due to pore water pressures. The Draft EIS states that there would be lesser rates of seepage at the Midas site due to less permeable soils. The Midas Creek site has the same storage capacity as the Little Cherry site and it would have far less visual impact on the area. The fact that the Midas site offers enhanced dam stability alone demonstrates that it is an environmentally significant alternative. The Forest Service should fully re-examine the viability of the Midas Creek site. (52)

Noranda's site selection clearly and completely complies with the goals of 404 by avoiding impacts to wetlands to the maximum extent practicable. (154)

The project is not water dependent: There is no demonstrated public need to destroy wetland habitat. (2)

EPA considers the wetland losses to represent a significant adverse impact to the environment and concludes that the Forest Service must develop alternatives to avoid the adverse affects to special aquatic sites. (85)

Section 230.10(a) of the guidelines stresses that no permit should be issued if there is a practicable alternative that is less damaging to the aquatic ecosystem than the proposed project. (85)

Response: Following publication of the Montanore Project DEIS, the agencies conducted additional analysis of alternative impoundment locations. The analysis discussed under *Tailings Impoundment Siting* in the *Alternatives Considered but Dismissed in the EIS* section of Chapter 2, was presented in the Supplemental DEIS and carried forward in the FEIS.

The analysis was conducted in compliance with the "404 Guidelines" developed by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency. These Guidelines govern the disposal of dredge and fill material, such as tailings, in wetlands and streams, or "waters of the U.S." Since the disposal of tailings in Little Cherry Creek is not water dependent, the agencies' analysis focussed on practicable alternatives that would result in less damage to waters of the United States and wetlands. Three alternative sites, Midas Creek, Little Cherry Creek, and Standard Creek, were evaluated. The agencies considered environmental resources, engineering considerations, and costs. All three tailings impoundment alternative sites would affect waters of the U.S. and wetlands. The Standard Creek site would affect more miles of perennial streams and more acres of wetlands than the other two sites. The Little Cherry Creek site would affect fewer miles of perennial streams but more wetlands acres than the Midas Creek site. The function and values of these wetlands could be replaced. The Little Cherry Creek site would affect the smallest drainage area of the three alternatives, and would require the least amount of stream diversions. No spillway or dam freeboard would be required for reclamation at Little Cherry Creek. Reclamation of the Midas Creek and Standard Creek impoundments would require routing of waters onto the impoundment and over a spillway located along the dam abutment. Considering both environmental and engineering factors, the Little Cherry Creek site is the most practicable and least environmentally damaging tailings impoundment alternative. The agencies dismissed Midas Creek and Standard Creek alternative tailings impoundment sites from further consideration.

8WE The project is not ecologically sound, it will eventually fail due to the build up of artesian pressure beneath the dam foundation. No project which carries such a high risk to the environment can be described as ecologically sound. Therefore, the Fish and Wildlife Service should recommend no support for this project. (2, 51, 86)

The recommendation of the Fish and Wildlife Service is guided by the agency's Mitigation Policy. 46 Federal Regulation 7657 (1981) Five criteria are listed. Failure to satisfy all three, without even discussing the remaining two elements of the Mitigation Policy, demonstrates the environmental danger of the Montanore Project. (2)

Response: The U.S. Fish and Wildlife Service, through the U.S. Department of the Interior, has submitted comments on both the DEIS and the SDEIS. These comments have been incorporated into these comments and responses. The USFWS also will provide consultation to the Corps of Engineers regarding the 404 permit.

9WE There is a public need to move the tailings disposal area away from the Little Cherry site. If the tailings dam is built at the Little Cherry site as proposed, a lot more than wetlands will be destroyed. A dam failure would destroy the ecosystem of the entire area. Over one hundred million tons of toxic tailings sludge would be distributed throughout the length of the Libby Cr. drainage. There is a demonstrated public need to avoid this danger by requiring a relocation of the tailings disposal area to a safer site. (2, 51, 170)

The Environmental Protection Agency should prohibit the specification of the Little Cherry site as a tailings disposal area. Dam failure will have catastrophic effects on the ecosystem. This would certainly constitute an "unacceptable adverse effect." (2, 152)

Response: The geotechnical aspects of the tailings disposal facility design adequately address safeguarding the environment.

10WE The proposed location of the plant is adjacent to the Ramsey Lake wetlands habitat. Mine facilities will necessarily disturb and displace habitat. Moving the plant site farther downstream would mitigate the impact on this wetland resource. (52)

Alternative locations to the Ramsey Creek plant site should not have been dismissed for the reasons stated in the Draft EIS. Clearly only minimal consideration was given to downstream sites. This constitutes an error and omission in the analysis contained in the Draft. Further study of alternative plant sites downstream of the proposed site on Ramsey Creek is clearly warranted. (52)

Response: No wetlands would be affected by the Ramsey Creek plant site. Alternatives to the proposed plant site location were considered in response to wildlife and visual concerns. A plant site downstream of the proposed site would have similar wildlife effects, primarily to the grizzly bear. Visual effects from Elephant Peak would be reduced. Increased construction and operations cost would be incurred with a plant site downstream of the proposed site. Additional waste rock would be generated by a longer adit.

Wetlands Mitigation

11WE The EPA feels the objectives of the proposed wetland mitigation plan are good. Additional specific wetlands mitigation information should be included in the Final EIS. This will better verify that the functions and values of the lost and impacted wetlands will in fact be replaced. (229)

Response: More information on Noranda's proposed wetlands mitigation plan is provided in Chapter 2. Chapter 4, *Wetlands and Waters of the U.S.* has been revised to include additional analysis of Noranda's plan.

12WE Noranda's proposed wetlands mitigation plan is inadequate. Current regulations require replacement of lost wetland and values at on-site and off-site locations on at least a 'one-for-three' basis rather than on the 'one-for-one' basis stated in the SDEIS. Some types of wetlands must be replaced on a one-for-five basis. (201)

Response: Wetland mitigation ratios are not "regulated." Mitigation ratios are typically established by the U.S. Army Corps of Engineers as part of the final mitigation plan in the 404 permit process. Noranda's wetland mitigation proposal meets the most recent guidance on wetland mitigation as provided by the February 6, 1990 Memorandum of Agreement between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines. The agreement states—

> "...mitigation should provide, at a minimum, one for one functional replacement (i.e., no net loss of values), with an adequate margin of safety to reflect the expected degree of success associated with the mitigation plan, recognizing that this minimum requirement may not be appropriate and practicable, and thus may not be relevant in all cases, as discussed in Section II.B of this MOA. In the absence of more definitive information on the

> functions and values of specific wetlands sites, a minimum of 1 to 1 acreage replacement may be used as a reasonable surrogate for no net loss of functions and values. However, this ratio may be greater where the functional values of the area being impacted are demonstrably high and the replacement wetlands are of lower functional value or the likelihood of success of the mitigation project is low. Conversely, the ratio may be less than 1 to 1 for areas where the functional values associated with the area being impacted are demonstrably low and the likelihood of success associated with the mitigation proposal is high."

13WE Noranda's proposed wetlands creation program will be marginally successful at best and more likely will be ineffectual. (201)

Response: The agencies anticipate that Noranda's wetland mitigation plan would replace the functions and values of affected wetlands. Wetland construction efforts by KNF in the area have been successful and a component of Noranda's proposed wetland mitigation is similar to the successful wetland creation efforts of KNF. Wetland creation, restoration and enhancement, however, is an inexact science. Noranda has recognized this problem and has proposed measures to increase the potential of mitigation success. These measures include salvage of wetland soils; establishment of a five year monitoring program; and establishment of an interagency review committee to address remedial mitigation measures if needed. The agencies have required a 2:1 replacement ratio for those wetlands which may be more difficult to replace and a 1:1 replacement for affected waters of the U.S.

14WE The agencies should reject these token proposals to create wetlands and require Noranda to implement a serious, substantive program of wetlands restoration and replacement. (201)

Response: The agencies have reviewed the proposed wetland mitigation program and have determined that it would adequately mitigate for affected wetlands.

15WE A timetable should be presented to show when the replacement wetlands and fishery enhancement projects will be functioning. We recommend that mitigation be in place at the time wetlands are lost. (227)

Response: The stated objective of the wetland mitigation plan is implementation of mitigation concurrent with wetland loss (see *Wetlands and Fisheries Mitigation Plan* discussed in Chapter 2, Alternative 1). Implementation of the wetlands and fisheries mitigation would begin during the construction phase.

16WE It isn't clear whether the mitigation will result in replacement wetlands comparable in biological value to those lost. Some evaluation of the comparable biological value of the lost and created wetlands should be included in the DEIS. (227)

Response: A stated objective of the wetland mitigation plan is the replacement of lost wetland functions and values at on-site and off-site locations (see *Wetlands and Fisheries Mitigation Plan* discussed in Chapter 2, Alternative 1). These functions would include biological functions. The proposed wetland mitigation monitoring program includes spring monitoring of wetland use by reptiles, amphibians, and breeding waterfowl, and late summer monitoring of wetland use by big game and other wildlife. Additionally, the proposed monitoring of the success of plant establishment and hydrological regime would aid in determining the biological value of the wetlands created. Descriptions of the existing wetlands and their functions and values are presented in the *Wetlands and Waters of the United States* section of Chapter 3.

17WE In the discussion of mitigation of wetland loss, there is not any discussion of the biological characteristics of wetlands that would be lost and how these would be replaced, or the time that would be required to develop the properties that would enable these newly flooded lands to function biologically as wetlands. Without such discussion this section of the SDEIS is deficient and must be judged inadequate. (249)

Response: The biological characteristics of the existing wetlands, including those that would be lost, are described in the Chapter 3, *Wetlands and Waters of the United States*. It is expected that the created wetlands would be "biologically functioning" wetlands (i.e., soils with anaerobic conditions during a portion of the growing season that support plants typically adapted to such conditions) within two years of implementation.

18WE Wetlands can be recreated and old growth will develop as trees grow old. Therefore, neither of these resources would be irretrievably lost. (139)

Response: The discussion under *Resource Commitments* in the *Wetlands and Waters of the United States* section of Chapter 4 has been revised to reflect Noranda's proposed wetlands mitigation plan. The agencies agree that wetland functions and values can be recreated.

BACKFILL/SUBSIDENCE

1BF The DEIS does not address the adverse environmental impacts which would result should subsidence to the surface occur either during or post closure of the mine. EPA believes a revised mine plan is needed that assures that subsidence will not occur to the wilderness. (85)

A major omission in the DEIS is analyses of the adverse impacts which could result from subsidence at the mine and resultant modification of the overlaying wilderness ecosystem. (85)

How feasible is it really to mine by sandwiching a barren but potentially toxic ore body between adits so that collapsing and seepage of acidic groundwater is minimized? (130)

Response: The agencies have revised the subsidence analysis; it is discussed in the *Geology and Geotechnical* section of Chapter 4. The agencies' detailed analysis is presented in a report by Agapito and Associates, Inc. (1990).

2BF Make them backfill waste into mined out areas as mining proceeds. We can't have 415 to 450 tons of waste rock on the surface. We can't keep throwing poisonous garbage into the land. (31)

Specifically, we urge capture, extraction, conversion and usage of all project resource assets, i.e. ore reserves, which can be made commercially available through responsible development strategies. We question creation of another Libby Dam size sediment-rock artifice permanently occupying and forever altering the Little Cherry Creek topography. All excavated underground openings must be backfilled with mined-processed tailings materials. To develop and utilize all ore reserves roof support pillars within the ore body must be safely, progressively removed for processing; a mine method easily accomplished by use of formed concrete backfill cells. Coarse fractions would be incorporated in concrete slurries. Such replacement of tailings material within the rooms, stopes and tunnels will eliminate 85-87% of otherwise surface disposed tailings. (141, 158, 164)

Reason for not hardening the tailings and returning them to the mine have not been adequately explained in the Draft EIS. This would decrease surface area of mine waste and reduce contamination. (164)

To improve underground and esp backfill operating efficiencies and to reduce surface disturbances by locating all ore processing equipment-facilities, underground, cast engineered, sub-superlevel, block-patterned chambers and utility-transport corridors must be constructed underground. This is best accomplished by concrete cell casting techniques. (141)

A full development of an alternative that puts tailings back into the mine needs to be done. The additional cost of replacing the tailings in the mine is well worth saving the water quality in Libby Creek. (81, 126, 85, 147)

Response: The agencies conducted additional analysis on the potential to backfill the mine. The agencies' revised analysis of backfilling is presented in the *Alternatives Considered but Dismissed from this EIS* section of Chapter 2. Backfilling is not a reasonable alternative.

3BF EPA believes that without cemented waste rock/tailings backfill material in place, a possible scenario of mine flooding via rock fracture/faulting flows, weakened structure failure and caving to the surface, surface subsidence above the mined-out area, acid formation in open and flooded stores filled by surface subsidence, snowmelt drainage and loss of Rock Lake and nearby environmental impacts of such subsidence will exist. EPA thereby believes the environmental impacts of such subsidence within the wilderness area are unacceptable. At a minimum, adverse visual impacts and environmental impacts of alteration of the existing drainage patterns which would result from subsidence needs to be evaluated. (85)

This alternative would also possibly provide some opportunities to reduce the risk of subsidence. (85)

Response: Chapter 2 has been revised to include additional information on the agencies' analysis of mine backfill. Backfilling was dismissed as a reasonable alternative. The agencies also conducted additional analysis of the subsidence potential. The agencies' analysis is presented under *Subsidence* in the *Geology and Geotechnical* section of Chapter 4.

TAILINGS IMPOUNDMENT

Dam Stability/Pressure Relief System

1TI The location and design of the tailings dam is fatally flawed. If the dam is built at Little Cherry Creek drainage it will inevitably fail. (2, 51, 52)

Dam construction will cause significant settling and consolidation of subsurface soils. This will pinch off permeable soil horizons. The result will be a significant increase in the groundwater pressure. Zones of permeable soil act as pressure relief conduits for groundwater flow. As these conduits are shut off by consolidation of soils under the weight of the dam, static water pressures will increase. These pressures will build to the point where the mechanical strength of embankment materials will give way under hydraulic pressure. The dam embankment will then become unstable and fail. Morrison-Kuntson Engineers, Noranda's consultants, were aware of the potential for this problem. (2)

The effect of a dam failure on esthetic, recreational, and economic values would be catastrophic. (2, 86)

Morrison-Knutson asserts that artesian pressures in the Little Cherry area are mitigated by the presence of a buried pre-glacial channel. The permeable channel fill acts as a natural pressure relief mechanism. However, in spite of this pressure relief, artesian conditions are still quite high. This indicates a high groundwater flow through the area. (2, 51)

Dam stability is predicated on the tailings drying out over time. The artesian conditions, however, will continue forever and, in fact, may be magnified by the impoundment. The groundwater flow in the buried channel will never stop. The tailings will remain saturated from the artesian action and will never dry out. Impoundment stability will never be achieved. (51, 123, 102)

Due to random interfingering of lakebed deposits, artesian conditions cannot be controlled. A buildup of these pressures will cause a dam failure. A dam failure will have catastrophic effects on human health and welfare as well as on fish and wildlife habitats. (2)

Morrison-Knutson evidently agree that the artesian pressures in the Little Cherry site would lead to dam failure. They propose to remedy the problem by installing pressure relief wells. Pressure wells will not remedy the problem. (2, 51)

Morrison-Knutson proposes to install pneumatic piezometers in three places in the dam to monitor the build up of pore water pressures in the foundation beneath the dam "during operation and for several years after closure of the impoundment," and will be reviewed once a year. The piezometric data will be used to determine the necessity for installing pressure relief wells. Due to random interfingering of silts and gravels, they would not reflect the build up of high pressures in other zones. The impoundment dam will be two miles long. The three piezometers cannot possibly monitor pressure build ups throughout its length. (2)

Noranda will have to wait until artesian pressures surface on the dam embankment in the form of slumps and landslides. The installation of a pressure relief well may alleviate the problem in the immediate zone but will not dissipate pressures in other artesian zones in the 2 mile length of the dam. Morrison-Knutson describes the location of random deposition of lake bed silts and glacial outwash as poorly defined. If they don't know where the artesian conditions will occur, they cannot know where to put their pressure relief wells. (2, 52, 126)

Over time, pressures will lead to dam instability and cause its failure. Noranda will likely have long finished mining and left the area when these severe stability problems develop. What contingency plans have been developed to deal with dam failure? Who will pay for corrective action or, at worst, clean-up of a catastrophe? (51)

Response: The basis of these comments is in large part contained in a report prepared by Geomax, P.C., for the Libby Placer Mining Company, Inc., attached to letter #2. The report is called the "Geomax report" in this response. It presents an evaluation of the geological, hydrogeological and geotechnical conditions at the proposed Little Cherry Creek tailings impoundment site, discusses the geomorphology of the site, and incorporates a review of portions of the geotechnical report for the site prepared by Morrison-Knudsen Engineers, Inc. (MKE) (Morrison-Knudsen Engineers, Inc., 1989b). The report purports to be a "fatal flaw" analysis of the tailings impoundment site characteristics and the tailings dam design developed by MKE. Because of the report's length and assertions of "catastrophic dam failure," the agencies' response, which follows, is long and technically detailed.

The agencies and Noranda agree that the source(s) of the perennial flow within Little Cherry Creek are likely filled, buried channels of moderate to high permeability, consisting primarily of sand, gravel and cobbles with minor amounts of silt and clay. These buried channels may be fed by Cable Creek and Bear Creek, generally flow to the east-southeast, and are expressed at the ground surface at the head of the Little Cherry Creek drainage basin in the form of a complex of springs. As noted in the Geomax report, these buried channels most likely extend downstream of the proposed dam alignment and ultimately to the Libby Creek drainage.

In the vicinity of the proposed tailings dam and impoundment, the groundwater system exists in a semiconfined to confined state, due to the presence of finer grained, generally low permeability soils of primarily lacustrine or glacial origin overlying and interfingered with the buried coarse-grained, soil-filled channels or overlying weathered bedrock. Semiconfinement to confinement of groundwater has resulted in the existence of artesian conditions at the site, with measured artesian heads in borings performed at the site ranging from zero feet to a maximum of about 37 feet (above the ground surface). Discussion and documentation of the artesian conditions is presented in various reports (Morrison-Knudsen Engineers, Inc., 1989b, 1990a, 1990b, 1990c). As noted in the Geomax report, surficial swampy zones and springs in the site area are probably an expression of the artesian conditions.

The static water level data from borings performed by MKE and others (Morrison-Knudsen Engineers, Inc., 1989b, 1990c), and summarized in the Geomax report, indicates that the measured static water levels vary over a wide range in elevation, from about 3370 feet (Boring LCTM-8, near the downstream toe of the proposed ultimate dam) to 3710 feet (Boring LCM-11, at the west edge of the ultimate impoundment). The higher groundwater elevations generally correspond to the upper reaches of the impoundment area. As indicated on the piezometric surface map, Figure 4 of the MKE addendum to the geotechnical report (Morrison-Knudsen Engineers, Inc., 1990c), the groundwater flow gradient is to the east. The measured static water levels within the dam footprint area range from elevation 3370 feet (Boring LCTM-8) to 3547 (Boring USB-3), and are with one exception below elevation 3500 feet.

Given the established artesian groundwater conditions at the site, it is theorized in the Geomax report that "...the weight of the (dam) structure will cause significant settling and consolidation (of finer-grained foundation soils) to occur. This settling and consolidation will tend to pinch off subsurface channels and reduce subsurface permeabilities in this area.... Additionally, the burial of the (wetland) area by the tailing will block virtually all of the relief zones which presently exist because most of the area between the proposed tailing dam and the lateral moraine will be covered by a thick blanket of very impermeable tailings." Based upon this anticipated mechanism of "pinching off" of subsurface channels, it is then postulated in the Geomax report that "..there will be significant increases in (artesian groundwater) pressure.. Pressure losses from flow will then be significantly reduced and the static pressure will rise" (letter #2). It is then concluded by Geomax that the resulting buildup in static artesian pressure will reduce the effective intergranular stresses within the dam and foundation soils, leading to an unstable dam structure and ultimately catastrophic dam failure.

Due to the applied stresses resulting from the construction of the starter dam, toe dam and the raised ultimate embankment, consolidation of the saturated, fine-grained foundation soils and compression of the coarser-grained soils within the depth of significant stress influence of the dam (a maximum height of about 350 feet at the ultimate dam centerline) would occur. MKE has not performed detailed analyses of the anticipated degree of consolidation and compression of the foundation soils. The results of four consolidation tests are presented in a MKE report (1990c); only one test represented foundation soils (boring DH-23). However, based on experience with similar projects at similar sites, it is anticipated that the maximum settlement (at the ground surface) beneath the dam would be on the order of a few feet. The permeability of the fine-grained soils would decrease to some extent as a result of consolidation. However, the degree of compression and decrease in permeability of the medium dense to very dense, primarily coarse-grained silt, sand, gravel and cobble strata and filled subsurface flow channels generally would be very small.

The more compressible finer-grained soil strata do not form the primary flow paths for groundwater. Given the thickness of the coarse-grained, confined, more permeable zones (generally tens of feet or more), the "pinching off" mechanism postulated by Geomax would not occur. The coarse-grained, subsurface, water-bearing flow paths for the artesian groundwater should remain largely unaffected by the applied embankment stresses. Therefore, significant increases in water pressure would not occur, and the catastrophic dam failure predicated on the "pinching off" predicted by Geomax would by necessity not occur.

It is the agencies' opinion that flow of groundwater beneath the site area would continue within the more permeable soil strata and buried channels subsequent to construction of the tailings dam and the impoundment of tailings behind the dam. Flow would most likely continue indefinitely beyond the 18-year life of the facility. Placement of the dam and impounded tailings upon the existing swampy areas would not result in significant blockage of the springs and seeps associated with these areas. It is expected that groundwater flow within these areas would continue and be expressed as seepage and springs in several areas, including within the impoundment area, at the base of the tailings mass or dam, at the toe of the dam, or downstream of the toe. Again, the catastrophic dam failure suggested by Geomax to result from the blockage of existing springs and seeps should not occur.

As noted in the MKE Interim Tailings Impoundment Engineering Report and the Tailings Impoundment Dam Pressure Relief and Seepage Control Conceptual Design report (Morrison-Knudsen Engineers, Inc., 1990a, 1990b, respectively), tailings fluid heads within the impoundment area would result in increased pore water pressures within the impoundment and dam foundation soils. Pore pressure increases also would occur prior to the process of consolidation of finer grained soils as discussed previously. Considering the combination of the pre-existing artesian groundwater condition, the potential effect of impounded tailings fluids and stress-induced pore pressures, and the resulting potential negative impacts on dam stability, Noranda proposes a system of pressure relief wells as part of the facility design. A detailed description of this system is contained in the MKE design report (Morrison-Knudsen Engineers, Inc., 1990b) and is summarized under Alternative 1 in Chapter 2.

MKE recognized that it is not possible to fully define the thickness, lateral extent, continuity and mass permeability of either the fine-grained, confining soil strata or the more permeable, water-bearing strata associated with the artesian groundwater conditions beneath the site. This lack of surety in the definition of subsurface conditions is the reason for the uncertainty about the effectiveness of the proposed well system, due to the concomitant lack of surety in the selection of the locations, depths and screened intervals of the relief wells. The dam construction method, consisting of raising of the starter dam with cycloned tailings sands in the downstream direction, further complicates the siting of such wells.

As is discussed in detail in the MKE design report, Noranda would use an observational approach to design and installation of the pressure relief well system. The initial conceptual set of relief wells for the starter dam would involve an array of wells spaced on about 200-foot centers and located about 100 feet downstream of the toe of the dam. The depth of the wells would depend on the location and thickness of the confined aquifer. A line of monitoring wells would also be located between the relief wells. Some of the relief or monitoring wells would be adapted for monitoring of piezometric pressure heads through the installation of pressure transducers; other wells could be equipped with pumps, if required, to increase collection of seepage or to facilitate piezometric pressure reduction. For the ultimate dam, well spacing would probably be increased because many of the previous wells subsequently buried beneath the raised embankment would still provide some degree of pressure relief, since these wells would be tied to the drain system (Morrison-Knudsen Engineers, Inc., 1990b).

Relative to the concept of an observational approach, the MKE design report states: “Once excessive (artesian) pressures are detected, whether by monitor well readings or by observation of soft seepage areas, sand boils or sloughing at the toe of the dam, the distressed areas would have to be promptly treated by installing additional relief wells and possibly by placing suitable fill over them to provide additional overburden weight. Prompt implementation of remedial measures to relieve localized distress would be a maintenance activity.. Because the initial pressure relief system would be of a smaller scale than [is] indicated by a conservative analysis, excessive pore pressures and distress could develop in localized areas of the foundation. These areas would be promptly treated by installing relief wells and possibly by placing a tailings fill surcharge over them. This work would be part of the regular maintenance of the impoundment" (Morrison-Knudsen Engineers, Inc., 1990b).

The agencies' analysis of Noranda's proposed pressure relief system is discussed under *Tailings Impoundment Stability* in the *Geology and Geotechnical* section of Chapter 4. An adequately designed pressure relief system would relieve artesian pressure and ensure embankment stability during the construction, operating and post-operating periods. The agencies believe, however, that a more conservative approach is needed during the initial construction and operation phase than that proposed in Noranda's conceptual design. It is during the initial construction and operation phase that the embankment would be most sensitive to the effects of artesian pressure within the foundation soils.

The agencies would require Noranda to provide a more conservative approach as part of final design of the pressure relief well system. Before final design, Noranda would collect additional subsurface data downstream of the dam alignment to better identify existing water-bearing strata. Noranda also would install a redundant ground water monitoring system including the use of multiple nested, open-well piezometers and pore pressure transducers. Additional monitoring and investigations would provide more detailed information on artesian pressures within the embankment area. These requirements are part of Alternatives 2 and 3.

2TI Some of the wells could be equipped with pumps, if necessary, to increase seepage interception or pressure reduction. (139)

Conceptual studies have been performed to evaluate the capability of the proposed pressure relief system to collect seepage from the foundation. The results illustrate the significant potential of the proposed pressure relief system to intercept impoundment seepage. (139)

Response: Analyses of the effectiveness of the proposed pressure relief well system are presented in the MKE conceptual design report (Morrison-Knudsen Engineers, Inc., 1990b). A simplified hydrologic model was utilized, including conservative estimates of aquifer thickness, soil strata permeability and thickness (of confining strata). The model essentially assumed homogeneous, isotropic, pervious and confining strata, each of uniform thickness. The confined aquifer was assumed to be recharged by a driving fluid head equivalent to the elevation of the decant pond in the impoundment and modeled as an infinitely long line source; i.e., a direct hydraulic connection between the decant pond and the well system elements was assumed to exist for both the starter and ultimate dam configurations. It appears that the line of relief wells was modeled as a drainage slot of infinite length; the well-to-well spacing must be sufficiently close to permit such an assumption. The line of wells was further assumed to partially penetrate the pervious stratum. A sensitivity analysis of the relief well spacing and depth was also performed.

It was estimated by MKE that about 40 to 70 percent of the seepage flow not intercepted by the embankment drain system (blanket drain and trunk drains) would be collected by the line of relief wells with the decant pond at its ultimate elevation; the range in the estimate is due to the presence or absence of pumps in the relief wells. The initial relief well system would be as described in a previous response and in the MKE design report (Morrison-Knudsen Engineers, Inc., 1990b). Given the difficulty of the analysis involved and the resulting need for use of simplified methods, MKE's analysis is probably a reasonable estimate of the potential effectiveness of the proposed relief well system. However, the quite complex subsurface stratigraphy at the site may not lend itself to such modeling techniques.

3TI Noranda has suggested alternative water collection/interception systems that would also be appropriate for collection of water prior to treatment (i.e. the pressure relief-interception well system or an interception trench below the tailings impoundment. (139)

Response: Noranda proposed using a pressure relief-interception well system (see previous responses). The agencies have two concerns with the proposed system. If seepage water quality is worse than currently projected, it may be necessary to capture a greater percentage of the tailings impoundment seepage to prevent this water from reaching Libby Creek. Secondly, if the interception well system fails to perform as expected, it is not clear what could be used as a backup remedy. The underdrain system as part of Alternatives 2 and 3 would provide a greater capture efficiency than the proposed interception well system. If the underdrain system fails to operate as expected, an interception well system could be used as backup.

Noranda has not proposed an interception trench. Its capture efficiency and feasibility at this site have not been addressed.

4TI You cannot stabilize a tailings pile of this size in the mountainous country that may get more than 100 inches of rain and snow. (31)

Response: Chapter 4 of the MKE Interim Tailings Impoundment Engineering Report (Morrison-Knudsen Engineers, Inc., 1990a) presents the precipitation criteria utilized in the tailings facility design, which also are discussed in Chapter 6 . The tailings impoundment facility design adequately and conservatively addresses the issues of storage of precipitation and snowmelt runoff, freeboard requirements and diversion of surface runoff.

5TI It should be clarified that the dam and impoundment as designed will be stable under the current groundwater conditions without the need for a pressure relief system. The purpose of the proposed pressure relief system is to control potential increases in groundwater pressure that might result from the rising tailings level in the impoundment. (258)

Response: As discussed under *Tailings Impoundment Stability* in the *Geology and Geotechnical* section of Chapter 4, the existing artesian groundwater pressures measured at the site are low and would not be expected to adversely affect the stability of the tailings dam. The dam stability analyses performed by Noranda and the agencies, discussed in Chapter 6, included an assumed phreatic (free water) surface located at a conservatively great height within the dam, much higher than would be expected under actual operating conditions with the existing artesian condition. The computed factors of safety from the various analyses were found to exceed generally accepted minimum values in all cases. The sentence in Chapter 2 referenced in this comment has been revised to indicate that the pressure relief system is not necessary "to provide dam stability."

6TI We do not consider Noranda's proposed pressure relief/seepage collection system to be even remotely adequate. What plastics are envisioned, what are their useful lifetime, break-down products, and persistence characteristics? (121)

Response: Noranda would be required to maintain the proposed pressure relief/seepage collection system throughout the life of the project and following mining until water quality standards would be met. It is not known how long Noranda would be required to maintain the system. It would depend on the actual quality of tailings water, the amount of tailings seepage, and the effectiveness of the pressure relief/seepage collection system.

Wells would be constructed in a typically monitoring well fashion using PVC pipe. Wells which no longer function adequately would be replaced if necessary.

7TI It should be clarified that Noranda's initial design for the relief well system consists of a passive system. The wells will only flow if and when the groundwater level reaches the well collar. Pumping of the wells would be implemented only if water quality considerations so require. In such a case, groundwater levels would indeed decline in the vicinity of the pumped wells. (258)

Response: The initially passive operation of the proposed relief well system is discussed under Alternative 1 in Chapter 2. The agencies agree that in the event of initiation of pumping within the wells, groundwater levels would decline in the vicinity of the wells. Chapter 4, *Ground Water Hydrology*, has been revised to reflect that ground water levels would not decline if only a passive system is used.

Gravel Drains

8TI The alternatives do not address the construction of a seepage collection system (gravel drains) with the intention of creating a point source and no treatment of water during the life of the mine. However, in the event that treatment may become necessary due to unanticipated chemical conditions within the tailings pile, then a treatment system could be installed without major retrofitting. With a passive seepage collection system in place, the option of treatment would exist, especially in the event of near or distant future (economical) treatment technologies. (26)

Since construction of the gravel drain system is complicated and will perform to stated specifications only when installed correctly, we insist that there be adequate monitoring and quality control inspections before this option is employed. (146, 161)

The system of gravel drains to control seepage is only sensible if the recovered water is treated before discharge. The wetlands method is desirable for its savings in electrical consumption and the fact that it is self-regulating which would be a great asset during the timeless post-operational phase. (146, 161)

MKE perceives the underdrain system as having a significant potential for failure. The proposed tailings disposal operation involves maintaining a decant pond at the upstream end of the impoundment. The need to reliably blanket the drain with tailings ahead of the decant pond throughout the life of the impoundment is seen as the main difficulty of this concept. Other potential problems include (1) piping of slimes into the drains, (2) plugging of the granular filter layers, filter fabrics, and drains and (3) crushing of drain pipes. (See letter for specific information). (139)

The following statements are made [in the SDEIS] “The lack of surety in the definition of subsurface conditions is the primary uncertainty about the effectiveness of the proposed well system ..” “The dam construction method...further complicates the siting of such wells.” The design and implementation of other systems for reducing seepage into the groundwater cannot likely be effected with any higher probability of success. Alternative engineering solutions can only provide back-ups to the pressure relief system to potentially improve the probability of success. (258)

The synthetic lining would then have no useful purpose; rather it would impede seepage into the drains. Since the lining would be a significant cost item and its intended purpose is highly questionable, it should be deleted. (139)

Response: The system of gravel drains beneath the tailings dam and impoundment developed by the agencies is discussed in Chapter 2 as part of Alternatives 2 and 3. With such a passive seepage collection system, a point source of potentially treatable water would be created at the downstream toe of the tailings facility. Assuming a properly and conservatively designed underdrain system and a good level of quality control during construction, a gravel drain system would continue to operate through the mine life. Were the need for treatment of collected water to arise sometime during the mine life, with the underdrain system in place and functioning, a treatment system could be installed, probably with minimal retrofitting of the existing seepage collection systems. Any of the treatment systems discussed as part of Alternative 3 could be used with the existing drain system without major effort.

As discussed in Chapter 2, a sufficient level of construction quality control is necessary to ensure that acceptable filter and drain materials are utilized and that the materials are properly placed. Quality control activities of this type are typically performed by a representative of the owner independent of the contractor performing the work, usually a geotechnical engineering firm. Were such a drain system to be specified, it is anticipated that an experienced firm such as MKE would prepare design plans and specifications for the system, and provide the services of engineering technicians for quality control activities.

The concerns expressed regarding potential problems associated with and possible failure of the proposed gravel underdrain system beneath the tailings impoundment include the following:

- Difficulty with adequately blanketing the drains with a layer of tailings ahead of the decant pond due to the steep slopes within the impoundment area;
- Piping of tailings slimes into the drains;
- Plugging of the granular filter layers, filter fabrics or drain rock; and
- Crushing of the drain pipes.

The recent tailings impoundment site plan prepared by MKE (Figure 2 of Morrison-Knudsen Engineers, Inc., 1990a) indicates a maximum estimated slope along either of the two primary stream channels of about 10 percent (0.10) (utilizing the 1 inch = 800 feet scale mapping with a 20-foot contour interval). Gravel drains having locally maximal slopes of about 10 percent can be adequately blanketed with spigoted tailings, preventing excessive inflow of tailings fluids into the drains. The steeper impoundment area slopes above the primary channels could be covered with a network of small-diameter corrugated, perforated drain pipes (with synthetic sock) draining to the main gravel drains as discussed in Chapter 2, eliminating the need for gravel drain construction in steeply-sloping areas.

As discussed previously, good quality control of production and placement of the filter and drain materials, and appropriate conservatism in the drain system design, provide sufficient protection against potential entry of tailings slimes into the drain section or plugging of the filters or drain. The facility design proposed by MKE already includes several elements which would require similar quality control efforts to ensure trouble-free and passive long-term operation, such as the blanket drain and filters, trunk drains, and chimney drains and filters (see Figure 2-11).

Regarding the potential for crushing of the drain pipe, work by Watkins and Reeves (1979) indicates that corrugated, perforated, high-density polyethylene drainage pipe would perform satisfactorily under embankment heights of 300 feet or more. This type of pipe has been observed to function properly under leach dumps up to 400 feet in height (Beckwith and others, 1987). Reeves et al. (1981) describe the development of this type of drain pipe.

9TI Neither the design basis nor a discussion of the methodology used in the agencies' analysis are presented to support the estimated seepage interception by the gravel drain system (300 gallons per minute) or its cost. The drains may form a conduit providing a direct connection from the decant pond to the toe of the dam, thereby increasing recycle flows and possibly increasing, rather than decreasing, seepage into the foundation. (258)

Response: The original estimate of 300 gallons per minute (gpm) of seepage interception by the proposed gravel drain system, as presented in the SDEIS, was based upon the agencies' experience with tailings disposal facilities of a similar nature and located in similar hydrogeologic regimes, at which gravel drain systems were constructed and operated. Additional analysis of the anticipated performance of such a drain system was performed by the agencies and is discussed below.

According to van Zyl and Robertson (1980), the design concepts of parallel drains have been studied in-depth in the agricultural field, and several detailed publications are available on the subject, presenting solutions for various seepage boundary conditions. The authors (van Zyl and Robertson, 1980) present a solution for flow into parallel drains for homogeneous, isotropic soil subjected to steady-state flow. An impermeable layer is assumed to lie directly beneath the drains. This assumption is judged to be reasonable, considering the assertion by MKE that "the vertical permeability of the foundation soils is relevant because seepage under a (tailings) slimes blanket would be close to vertical in the immediate vicinity of the slimes. It is expected that the vertical permeability of the impoundment soils would be of the same order of magnitude as that of the slimes" (Appendix E in Morrison-Knudsen Engineers, Inc., 1990a). Water is assumed to infiltrate from a pool on the tailings impoundment (decant pond), under partially saturated flow conditions, down to a phreatic surface (see Figure 2 in van Zyl and Robertson, 1980).

The flow rate per unit length, q, into each drain is estimated from the Donnan equation (U.S. Department of the Interior, 1978; van Zyl and Robertson, 1980):

$$q = \frac{4kt^2}{s}$$

where

k = coefficient of permeability of material (tailings),

t = height of phreatic surface above floor of impoundment at midpoint between drains, and

s = spacing between drains.

The relationship between the height of the phreatic surface, t, and the drain spacing, s, can be expressed as follows, if it is assumed that complete drawdown occurs at each drain (van Zyl and Robertson, 1980):

$$t^2 = \frac{ws^2}{4k}$$

where w = the infiltration rate through the material (tailings).

The magnitude of k is taken as the horizontal coefficient of permeability of the tailings, which is considered to be equal to the permeability of the coarsest (most permeable) layer. Because of the presence of layers of tailings slimes in the impoundment, it can be assumed that, in general, the infiltration rate (w) is an order of magnitude or more less than k (van Zyl and Robertson, 1980). The infiltration rate is controlled by the layer of tailings having the lowest coefficient of permeability; for the proposed facility, consistent with values proposed by Noranda (Morrison-Knudsen Engineers, Inc., 1990a; Noranda Minerals Corp., 1989a), k was assigned a value of 1×10^{-5} centimeters per second (cm/s) (about 2×10^{-5} feet per minute), and w was selected as 0.1k, or 1×10^{-6} cm/s (2×10^{-6} feet per minute).

For purposes of analysis, gravel drains were conceptually located in each of the two main drainages within the impoundment area (Little Cherry Creek and a tributary to the north). The spacing of the drainage(s) would vary from about 800 to 3,000 feet, with an average spacing of about 1,200 feet, and the total length of the two drains was computed to be about 10,000 feet. Utilizing the above values for k, w and s, the inflow per unit length of drain was estimated to be about 0.02 gpm per foot of drain, or 200 gpm for the entire 10,000 feet of drain. If it is assumed that only 5,000 feet of drain (half the length of each drain) is subject to inflow at a given time, the total inflow is reduced to about 100 gpm. This range of inflow values compares favorably with the revised estimated seepage rate of 120 to 300 gpm provided by Noranda (Morrison-Knudsen Engineers, Inc., 1990c).

As is discussed under Alternative 2 in Chapter 2, the estimated construction cost of the drain system is dependent primarily on the final design and configuration of the system and the availability of drain rock and filter materials within the local project area. Depending on the degree of processing required to make these materials, typical in-place unit prices could be expected to range from about $5.00 to $10.00 per cubic yard. The estimated system cost of $1 million to $2 million presented in the FEIS is an order of magnitude estimate based on the agencies' experience with such systems.

The agencies acknowledge that the proposed gravel drains could form a direct conduit from the decant pond to the blanket drain and seepage collection pond at the toe of the dam; in fact, were the drains constructed, they would necessarily extend beneath the dam and daylight above the collection pond. Therefore, it is clear that recycle flows from the collection pond back to the impoundment (or to the mill makeup circuit) would increase significantly without proper management and startup procedures of the tailings impoundment. Specifically, beginning at facility startup, a tailings cover would need to be spigoted over the drains ahead of the advancing decant pond, using single-point discharge lines, such that a "filter cake" of tailings would be formed on the surface of the drain. This filter cake would serve to limit the inflow into the drains and aid in formation of the decant pond, which would be reclaimed by barge.

Contrary to the comment, flow through the drain system, through the blanket drain beneath the dam and into the seepage collection pond, would not cause an increase in seepage into the foundation, were these elements properly designed with sufficient flow capacity and redundancy. The effect of these drainage elements is to minimize fluid heads, typically to no more than a couple to a few feet of water, while providing very high flow capacity. The reduced fluid heads on the subsurface native soils therefore result in reduced seepage, since seepage rate is dependent on driving head. As is noted by van Zyl and Robertson (1980), subsurface drainage systems placed above the liner of lined impoundments reduce the hydraulic head on the liner, thereby reducing the quantity of seepage through the liner.

10TI The percent(age) of seepage recovery at the relief well system will probably be different depending on whether a gravel drain system is in place or not. (258)

Response: The agencies recognize that if a gravel drain system installed within the impoundment, the quantity of tailings impoundment seepage intercepted by the relief well system would necessarily decrease, as the drain system would intercept a portion of the seepage flow at the floor of the impoundment, prior to this flow reaching the zone of influence of the relief wells.

Storage Capacity

11TI Is the existing tailings storage area large enough to hold any additional tailings? The document states that it is capable of holding 120 million tons, though Noranda expects to have only 100 million tons. Is 20 million tons excess capacity sufficient? Will additional environmental review be conducted if additional mineral is encountered which would necessitate a longer mine life and changes in tailings storage? (117)

The DEIS states - "the deposit has not been fully delineated and likely extends further north than the available drilling information indicates." If the ore deposit is larger than described in the mine plan, it follows that the mine life is likely to be longer than 16 years and that its impacts will last longer than stated. We recommend that the EIS include an explanation of how impacts and mitigation beyond the 16-year period will be addressed. (171)

Response: Increased ore reserves could result in increased tailings storage. The 20 million tons excess capacity in the tailings impoundment is expected to be sufficient. Increased disturbance associated with an impoundment larger than that described in the FEIS would require additional permitting and preparation of associated NEPA/MEPA documentation.

12TI The SDEIS states that if the adits produce more discharge than anticipated, the tailings impoundment could be used for temporary storage. How would that affect impoundment stability, the proposed drain system and downgradient water quality? (227)

Response: The anticipated small volume of adit discharge that would be stored in the tailings impoundment (estimated at 131 gpm in Year 1, and decreasing to zero in subsequent years) is expected to have a negligible effect on the impoundment stability. The tailings impoundment includes about one and one-half to four years of storage capacity for expected mine and adit inflows; excess water would be discharged to the Ramsey Creek or Little Cherry Creek land application disposal areas. The dam stability analyses performed by Noranda and the agencies, discussed in Chapter 6, included an assumed phreatic (free water) surface located at a conservatively great height within the dam, much higher than would be expected under actual operating conditions, even given the additional volume of adit discharge into the impoundment. The computed factors of safety from the various analyses were found to exceed generally accepted minimum values in all cases.

It is anticipated that temporary storage of adit discharge within the tailings impoundment would have a negligible effect on the proposed drain system, as a properly designed system would have large enough flow capacity to handle the additional drain inflow caused by the adit discharge. It is further anticipated that effects on the downgradient water quality would be negligible.

13TI We would like to see the dam operate closer to the 4-year freeboard level so that flood waters could be held back during rain-on-snow events. (257)

Response: The excess water storage capacity of one and one-half to four years is dependent primarily on the estimated precipitation and evaporation rates utilized in the water balance and extrapolated out through Year 16 of the impoundment life. The excess storage capacity is at a minimum in Year 1 of operations and reaches a maximum in Year 16. It is anticipated that Noranda would not be able to maintain freeboard approaching the four-year freeboard level during the first roughly two-thirds of the impoundment life. However, the tailings impoundment is sized to completely contain runoff from the 24-hour Probable Maximum Precipitation (PMP) event plus snowmelt, with three feet of additional freeboard. Therefore, the impoundment is sized to safely store a very extreme rain-on-snow storm event without the additional few years of freeboard.

Reclamation

14TI The reclamation plan for the tailing impoundment site calls for the reforestation of the site. This requires that the surface be contoured, graded, and capped with a thick cover of top soil. Contouring and grading cannot be undertaken until the surface of the impoundment has dried out sufficiently to support the weight and activity of earth-movers. (52, 158)

Noranda expects that this process will be completed and total reclamation of the site accomplished within one or two years after mine closure. However, this expectation may be somewhat optimistic. How would reclamation be achieved if the tailings drying time were 10 or 20 years? The draft fails to address these possibilities. These rather vague estimate demonstrates that neither Noranda nor the reviewing agencies have any idea of when or if the tailing slimes will ever dry out. In fact, the seepage control and dam stability plans virtually assume that the tailings impoundment will not dry out. (51, 52)

The water pumped from the wells installed to relieve the buildup of pore pressures in the dam foundation, and the seepage water from the impoundment site that is collected behind a seepage control dam will be pumped back into the impoundment site. This water along with surface runoff will collect in several depressions or ponds on the impoundment site. If these areas remain unaltered, and ungraded, they will constitute "continual recharge" points for the impoundment. As long as these recharge areas remain wet, they cannot be regraded. As long as they remain ungraded, they will remain wet. As long as this is the case, the impoundment site cannot be reclaimed. (52)

Surface runoff can be controlled to some extent, but seepage, springs and pressure relief wells cannot be controlled. As long as this water is generated, the tailings impoundment site cannot be reclaimed. (52)

Laboratory testing of tailings from a pilot grind indicate that the tailings are non-plastic. Detailed consolidation analyses will be performed during final design and the results incorporated in the grading plan for reclamation of the tailings surface. (139)

Placement of waste rock is proposed only for certain areas as required to improve trafficability. Where the tailings surface is sufficiently firm to withstand equipment traffic, topsoil would be applied directly to the tailings surface and revegetated. (139)

Noranda's reclamation plans for the tailings impoundment site indicate that it is doubtful that they will ever be able to reclaim the site as required by law. If complete reclamation cannot be definitively proven, then the project should be dismissed altogether. (86)

Response: Two consolidation tests were commissioned by MKE (and performed by Chen-Northern, Inc.) on artificially sedimented samples of tailings slimes produced from a pilot grind of Montanore site ore. The samples were sedimented from slimes slurry having a solids content and gradation representative of the proposed project tailings slimes. Results of these consolidation tests indicate that the non-plastic tailings slimes would consolidate reasonably quickly under applied loads (Morrison-Knudsen Engineers, Inc., 1990c). Based on these test results, a significant fraction of the total consolidation settlement likely would occur during impoundment filling, as the impounded tailings consolidate under the applied load of overlying tailings. MKE has stated that detailed tailings settlement analyses would be performed as part of the final facility design, and the results of these analyses would be incorporated in the reclamation grading plans for the impoundment.

The ultimate impoundment (crest elevation 3,710 feet) for the proposed tailings disposal facility would involve a maximum vertical thickness of deposited tailings on the order of 300 feet, located within the main drainage paths just upstream of the starter embankment. The maximum horizontal distance from the embankment crest to the furthest reaches of the ultimate impoundment is approximately 6,000 feet.

Immediately after cessation of tailings deposition, the surface of the impoundment would most likely be comprised of a relatively firm and dry tailings sand beach, a relatively soft and saturated slimes surface and a submerged area beneath the decant pond (Vick, 1983). In order for the proposed reclamation and stabilization efforts (regrading, placing topsoil and revegetating) to be effective, the entire impoundment surface must be sufficiently firm to support the necessary equipment. The amount of drying time necessary to achieve this degree of firmness would vary greatly over the impoundment surface, depending on the nature of the tailings, the size of the pool and climatic conditions. Surfaces composed of coarse tailings sands may be sufficiently dry and firm within several days, whereas zones of slimes may require a drying period lasting a year or more, especially in the vicinity of the decant pond. Drying of the decant pond would be accomplished via drainage and evaporation.

Consolidation and settlement of the tailings would occur as excess pore water pressures within the tailings are dissipated (Nelson et al., 1983). Continuing drainage of the tailings would result in lowered water contents and pore water pressures. Consolidation could also be accelerated by placement of a relatively thick cover comprised of compacted soil or mine waste materials. A 1 1/2-foot thick soil layer would be placed on the impoundment surface, whereas placement of waste rock is proposed only for certain areas to improve trafficability for equipment (Morrison-Knudsen Engineers, Inc., 1990a). Settlement of the coarser tailings zones would occur rapidly, as the excess pore pressures dissipate quickly; however, desiccation and consolidation of the slimes surface may require considerable time. Studies by Krizek et al. (1977) of 2- to 3-meter thick (6.6 to 9.8 feet) surficial layers of dredged fill indicated that settlements of about 0.2 to 0.4 meter (0.7 to 1.3 feet) required about 250 days to occur. Complete consolidation of the slimes would probably take considerable time, on the order of several months to several years, depending on the vertical thickness.

Maximum total consolidation settlements of the tailings surface are anticipated to be on the order of about 10 percent of the vertical thickness, ranging from a few inches at the impoundment edges to perhaps 20 to 30 feet at the thickest deposit. The maximum incremental consolidation settlement subsequent to cessation of tailings deposition is estimated to be a few feet to perhaps 10 feet.

Without adjustments to the tailings surface during reclamation, direct precipitation and resulting runoff on the impoundment surface and runoff from the limited watershed above the impoundment would tend to collect in the decant pond area. If the surface remains unaltered, this former pond area would be a continual recharge point for the impoundment. Because of the heterogeneous nature (both horizontally and vertically) of the tailings deposit, differential settlements of the impoundment surface would probably occur, resulting in minor surface undulations and localized ponding of direct precipitation and any runoff impacting the surface. However, the magnitude of recharge and resaturation of impounded tailings resulting from this localized ponding would be very small when compared to the recharge via runoff concentrating within the decant pond area depression.

The initial reclamation efforts proposed by Noranda are directed toward minimizing the quantity of surface runoff impacting the pond area by grading the impoundment surface to drain direct precipitation and runoff. Contouring and regrading of portions of the tailings surface would be accomplished via the formation of two drainage swales in order to prevent the collection of surface runoff in the pond area. These swales would drain surface water to the Bear Creek drainage. Contouring of the surface would also serve to minimize the small amount of recharge occurring within localized areas subjected to differential settlements. Drainage ditches would also be excavated along the north and west edges of the impoundment, grading to the northwest corner (Morrison-Knudsen Engineers, Inc., 1990a).

As part of the reclamation plan proposed by Noranda, cycloned sands would be deposited in the impoundment during the final year of operation. In addition, a cycloned sand berm would be formed along the south and east sides of the impoundment (Morrison-Knudsen Engineers, Inc., 1990a). Peripheral spigotting of tailings would also be accomplished along the wing dikes and south saddle dam crests during later stages of the operation.

Minimizing recharge of the tailings by watershed runoff would decrease the time required for surface drying, allow earlier placement of the topsoil cover and permit vegetation to gain a foothold. Once the vegetative cover is established, further resaturation and recharge of the tailings should to be minimized. As discussed in Chapter 2, however, seepage and artesian groundwater flow collected by the relief well system would be pumped back into the tailings impoundment, a flow of about 200 to 400 gallons per minute. Following operations, the pressure relief/seepage collection system would remain in place and water would continue to be pumped back to the impoundment. The tailings impoundment would be partitioned to provide an area for water storage. The remainder of the tailings impoundment surface and the embankment would be regraded, topsoiled and revegetated. Water intercepted and recycled to the impoundment would be evaporated using sprinklers. The post-operational water balance would include additional water disposal to the land application disposal area, and to constructed wetlands near the impoundment to the extent allowable by water quality considerations. As embankment seepage and required seepage collection decrease, the storage requirement on the tailings impoundment would decrease and additional area would be reclaimed. When reclamation of the tailings surface is complete and as seepage from beneath the impoundment decreases, the amount of water pumped back would decrease. Depending on tailings water and ground water quality, pumping would eventually cease. Inflow into the reclaimed tailings pond would be limited to infiltration. Outflow from the reclaimed tailings pond would consist of seepage from beneath the impoundment and through the dam. The phreatic surface (water level) in the impoundment would reach equilibrium when the inflow equals the outflow. Noranda estimates that equilibrium conditions would be reached in 20 to 25 years if the seepage collection dam is removed, or 35 to 40 years if the dam is left in place and embankment seepage is returned to the impoundment.

The contouring and regrading activities proposed by Noranda could be accomplished in an incremental fashion as areas of the impoundment become accessible by equipment. Each increment of area, or "cell, " could then be graded and contoured to promote drainage of surface runoff to the impoundment perimeter. Each cell would also then be available for placement of topsoil material and subsequent vegetation.

The commenters are correct that in the construction of the reclamation cap for the tailings pond, surface strength is a critical operational consideration. It is quite possible to mire equipment in wet slimes. Despite these difficulties, the mining industry has considerable experience in the construction of reclamation caps on low strength surfaces. In particular, Noranda reclaimed the Gray Eagle mine in northern California using a synthetic geotextile underlying a thin soil cover graded onto the surface. This provided a base of sufficient strength to support construction equipment. Other techniques which may be employed include the grading of jetties of ballast out onto the tailings pond surface to create causeways for working equipment, from which cover material would be dumped and graded out onto the tailings surface. At other projects, vertical drains have been used to help de-water the tailings.

15TI Interim reclamation will be practical only in areas where no additional tailings deposition is anticipated for an extended period of time. (139)

Response: Interim reclamation of the tailings dam slopes would be performed only within areas that would not be subject to additional deposition of tailings sands for an extended period of time. The agencies agree that reclamation via reseeding of areas that would immediately or soon be covered with additional tailings would be a wasted effort.

16TI The analysis of reclamation of the tailings pond does not indicate where the topsoil will come from to "reclaim" it. While it says that topsoil will be "saved" to recover the top of it, it fails to say where the topsoil will come from to cover the sides. Where will this additional topsoil come from? It seems like an enormous excavation will be needed somewhere and the visual and environmental impacts of this must be accounted for in the final EIS. (81)

Response: Table 2-9 presents estimated soil salvage volumes. The volume indicated for the tailings impoundment is adequate to cover the surface and sides to the depths proposed by Noranda. The visual and other effects of the tailing impoundment are documented in Chapter 4.

17TI "Topsoil" in the proposed tailings area is not 4' deep - there is hardly any place on the Kootenai that has topsoil levels this deep. (81)

Response: Depths indicated in Table 2-8 represent depths of soil suitable as a plant growth medium.

18TI Reclamation means reclaiming the land as closely as possible to its original setting. A huge dam and a large flat plateau will not fit into the surrounding landscape and will be an eyesore for the foreseeable future. (245)

Response: The Montana Metal Mine Reclamation Act requires reclaiming mining disturbances to comparable stability and utility to that of adjacent lands. Forest Service mineral regulations require that operations reclaim surface disturbances to prevent or control on-site or off-site damage to the environment. Noranda's proposed reclamation plan meets these requirements. It would be impossible to reclaim the tailings impoundment to its original setting. The dam would remain visually inconsistent with the surrounding landscape. The visual effects are discussed in the *Visual Resources* section of Chapter 4.

Miscellaneous

19TI The proposed slurry pond represents a potential threat to the Kootenai River should there be a major breakdown in its containment. Inadequate consideration has been given to some of the alternatives that would reduce the risk. If these alternatives have been rejected on the basis of economics, that is not a proper basis for public agencies to discard alternatives. (43, 102, 181)

The Forest [Service and the State must] demand that Noranda investigate alternative methods of tailings disposal more thoroughly. The agencies must not become Noranda's "captive regulators." The agencies must do the right thing and reject the proposed Little Cherry tailings disposal site. (51, 164)

Response: Pursuant to the requirements of the National Environmental Policy Act (NEPA), the EIS must "rigorously explore and objectively evaluate all reasonable alternatives (to the proposed action), and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated." The Montana Environmental Policy Act (MEPA) states that "The agency is required to consider only alternatives that are realistic, technologically available, and that represent a course of action that bears a logical relationship to the proposal being evaluated." The comment questions the adequacy of the level of consideration given in the DEIS to alternatives that would reduce the risk to the Kootenai River posed by the potential for a major breakdown in the tailings pond containment. Relative to the various alternatives that were considered but dismissed in Chapter 2, this comment would seem to apply to the alternative tailings embankment construction methods and tailings disposal techniques that were considered.

The as-proposed downstream construction method for the tailings embankment is superior from the perspective of static and pseudostatic (seismic) stability to either the centerline or upstream methods. Conventional backfilling of underground workings with tailings sands was dismissed as an unreasonable alternative because this action would increase the total area of surface disturbance as much as 1,000 acres (due to additional borrowing for dam construction), and may increase mine operating costs by 50 to 100 percent. Whole tailings backfilling of the workings was dismissed from further consideration because the process is not yet technologically viable. The option of dry tailings storage was dismissed due to the lack of any significant environmental advantages over the proposed action and an increase in operating costs. These alternatives were not dismissed solely on the basis of economics.

20TI Outside consulting team needs to be hired by the agencies to thoroughly review Noranda's impoundment design as is planned for the Rock Creek site. Agencies need further expertise to make a thorough judgement as to the acceptability of the design. (126)

Response: The agencies and the EIS contractor have thoroughly reviewed Noranda's proposed designs for all facilities. Additional review would be conducted following submittal of final design plans.

21TI An 18-year dam construction period is currently envisioned. Also, minor revisions were made to the tailings impoundment design subsequent to the date of the permit application. Revisions include: Both the seepage collection dam and the tailings dam have been relocated about 300 feet upstream. The tailings dam crest elevation has been changed to 3710 feet in order to provide the required storage capacity. The revised maximum dam height is about 370 feet instead of 380 feet. (139)

The diversion channel, diversion dam and starter dam will be built concurrently, with due consideration to creek diversion requirements and best material handling practices. (139)

Additional borrow areas west and south of the impoundment are being considered as potential sources of embankment materials (see Figure 1 of July 1990 Interim Impoundment Engineering Report). The riprap thickness has been revised to two feet for the 100-year peak flood. (139)

The tailings dam drainage system has been modified slightly. (139)

The finger drains have been replaced by the blanket drain to increase drainage of the abutments, see comment No. 6. (139)

The diversion channel design includes a stair-stepped chute structure at the outlet. The proposed design would increase channel stability. If topsoil erosion is a problem, topsoil would be stabilized by use of mulches, tackifiers or other appropriate methods. (139)

Response: The discussion of the impoundment in Chapter 2 has been revised to reflect Noranda's current proposal.

22TI The current condition [of the unnamed tributary receiving flows from the diversion channel] should provide considerable erosion protection against the diverted flows. Therefore, initially, erosion protection is not planned for the stream channel. Erosion protection will be constructed if erosion is observed during operations. Such protection would consist of rockfill bars or gabions. (139)

Response: The agencies do not agree that the current condition provides adequate erosion protection. The agencies' analysis is presented under the *Runoff and Sedimentation* section in the *Surface Water Hydrology* section of Chapter 4. Alternatives 2 and 3 include mitigation designed to reduce sedimentation.

23TI The relatively steep slope of the channel invert makes it unlikely that sediments will be deposited in the channel. The possibility of channel overtopping is considered quite low. The potential for transport of tailings into Libby Creek is considered remote. (139)

The diverted stream has a greatly reduced length along which to deposit sediment, compounding the problem of additional sediment being added to LCC. If the diversion channel were unable to transport the sediment load from the upper stream and adjacent hillslopes, the excess sediment would be deposited in the diversion channel, reducing its flow capacity. (170)

Response: The design slope of the diversion channel is about 2.4 percent (Morrison-Knudsen Engineers, Inc., 1990a). The agencies analyzed channel flow characteristics utilizing the design channel section presented in the MKE report (1990a) and the Manning equation for open-channel flow, assuming a Manning's roughness "n" value of 0.035 for a riprap-lined channel. The analysis indicates that for flows less than 100 cubic feet per second (cfs), the normal flow velocity is in the range of about 4.5 to 6 feet per second. The velocity of flow for a discharge of 10 cfs would be about 4.7 feet per second. The agencies agree that, because of the steepness of the channel, it is unlikely that sediment would be deposited in the channel, even at low flows.

24TI The term “permanent diversion channel” would appear to imply a massive structure. A riprapped drainage swale should be sufficient, since the drainage area is of limited size and generally gently sloping. (139)

Response: The agencies have revised the mitigation for Alternative 2 to indicate the channel for transporting runoff from the reclaimed tailings impoundment surface to Bear Creek would consist of a riprap-lined drainage swale, which should be sufficient given the limited drainage area and gentle slope of the impoundment surface.

25TI It will be difficult to survey the crest of the tailings dam during operations, since it will be continuously raised with deposited tailings. (139)

Response: The agencies agree that surveying of the dam crest to assess movements would prove difficult, since the embankment would be raised incrementally with cycloned tailings sands. It is suggested that to the extent possible, permanent control points be established on the final dam crest after cessation of sands deposition. Compression and consolidation of the finer grained foundation soils and dam materials should occur over fairly long time periods in response to increased stresses. The suggestion by MKE that survey points be set at foundation level along the downstream dam toe also has merit. The monitoring plan discussed in Appendix B has been revised to reflect these points.

26TI The dam is planned with a sedimentation basin, which would require regular dredging during the 16-year life of the project. This is not discussed in detail in the document. (170)

Response: It is anticipated that several embankment structures within the facility would collect sediment to varying degrees, including the north saddle dam, the diversion dam and the seepage collection dam, and also the sumps at the dam toe. It is expected that these facilities would require periodic dredging of collected sediment during the project life. Sediments would be stored in the impoundment; total volume would be relatively small compared to the 100 million tons of tailings.

27TI Downstream sediment deposition could be partially relieved by rockfill bars as proposed in the study. Sediment would have to be removed regularly, but a plan is not outlined. The rockfilled bars would need to be in place when the channel is built, not “after operations” during which the single greatest amount of sediment has been produced. (170)

Response: The diversion channel design has been modified from that presented in the DEIS. The diversion channel design discussed in Chapter 2 includes a 300-foot, stair-stepped chute structure at the channel outlet. This structure, which would be comprised of three-foot high gabions, is designed to dissipate flow energy, minimize erosion potential, and increase channel stability. If erosion is observed during or at the end of operations, rockfill bars or gabions would be placed perpendicular to the natural stream channel below the diversion channel to provide energy dissipation and protect against erosion.

28TI How will the tailings get from the mill to the thickener? (121)

Response: The tailings would be pumped from the mill to the thickener.

29TI Will the ore stockpile be roofed to protect it from acid precipitation? (121)

Response: The ore stockpile would not be roofed to protect it from acid precipitation. Acid drainage would not be expected since the ore would remain in the stockpile for a very short period of time.

30TI What are the specifications of the ditch paralleling the tailings pipelines? Will it be lined with an appropriate impermeable material? What? (121)

Response: An unlined ditch paralleling the entire length of the pipelines would contain and transport any discharged tailings to the tailings impoundment. Containment and surface water runoff ditches would be constructed with an earthen berm between them. This berm would ensure that in the event of a rupture, all tailings would remain in the ditch and not come in contact with surface waters. Where the pipelines cross Poorman Creek, a lined flume and trestle would be constructed. Noranda has designed a number of measures to prevent or mitigate ruptures in the tailings pipelines. These are discussed in Chapter 2, *Tailings Storage*.

31TI The reference to an unlined collection pond, which is not consistent with the project proposal which describes a compacted clay layer. (258)

Response: The most recent MKE design report (1990a), page 6-7, states that "clayey silty soils for the seepage collection dam will be obtained by excavating materials within the seepage collection pond area..If bedrock with open joints or soils consisting of sandy gravels and cobbles are exposed during grading operations, these areas will be covered with a 3-foot thick layer of compacted clayey soil to minimize infiltration of water into the foundation." In the agencies' view, Noranda's proposal does not imply that a compacted clayey soil liner would be installed within the entire seepage collection pond; therefore, seepage is anticipated to occur from this pond, the volume being dependent on the long-term resident fluid level within the pond and the vertical permeabilities of the native soils or compacted fill at the pond bottom.

32TI No excavation below the existing drainage bottom is planned. (258)

Response: The text in Chapter 4 has been revised to eliminate the reference to the excavation.

33TI The document has no diagram illustrating the tailings line and little explanation of how the material will be moved and safeguarded. (130)

Response: Alternative 1 in Chapter 2 discusses Noranda's proposed tailings slurry line, and safety features which would be implemented. Noranda's permit application contains more detailed information.

34TI The summary section [of the DEIS] described the tailings impoundment area of disturbance as 595 acres. However, in the body of the text, the disturbed area is listed as 729 acres. Why is there a discrepancy?

Response: The tailings impoundment would cover about 460 acres; the impoundment and other facilities would cover about 994 acres. This acre figures are discussed in Chapter 2.

35TI Has a suitable clay source been found? If so, has the environmental impacts been addressed?

Response: Many of the site soils are fine-textured. Clay to cover sandy and gravelly areas would come from within the tailings impoundment area. The liner which is part of Alternative 3A would be synthetic; suitable clay material is not available on-site and would be prohibitive to import.

36TI Predicted mill tailings grain size gradation is not provided. Will there be enough sands generated from the mill to construct the impoundment?

Response: Chapter 2 has been revised to indicate that Noranda has evaluated expected tailings production and anticipates that adequate sand tailings would be available for dam construction. Noranda's permit application includes expected grain size gradations.

CLAIM VALIDITY

No Discovery Prior to Withdrawal

1CV The Noranda Minerals Corp. has no legal basis for claiming the Montanore Project ore body. This area was closed to mineral exploration on January 1, 1984. Only pre-existing valid claims could be developed after that date. Noranda's claims fail to meet this test. (33, 86, 94, 128)

Improperly relied on evidence of mineralization outside of the subject mining claims to establish the existence of a discovery. (3)

Borax reentered the Wilderness in 1984 to deepen drill holes HR2 and HR3 in an effort to find sufficient mineralization to validate their claims. If the deposit requires additional exploration to delineate the ore reserve and determine grade or quality before development may be confidently started, a discovery has not been made. Since there was not a marketable deposit delineated prior to withdrawal, it makes no difference how valuable this deposit later proved to be, it is not valid, because there was not discovery of a marketable deposit prior to withdrawal. (58)

Pages 13 and 14 of the SDEIS state that: "Exploratory core drilling would be performed before full-scale mine development. The drilling would be used to collect information on geologic structures, ore thicknesses, ore grades and hydrology." Surely the Agencies recognize that the Wilderness Act prohibits exploration activities in designated Wilderness Areas. This additional exploration activity by Noranda therefore is clearly in violation of the law. It further confirms that the original validity determination made on the four HR claims that are the basis for Noranda's Montanore activities was in error because the criteria for discovery of a valuable mineral deposit per the Mining Law of 1872 were not met. Noranda's continued exploration activities are in direct contravention to numerous court decisions, including that made by the IBLA in the important U.S. v. Freezor case. (201)

Noranda is still in the process of determining if the Montanore orebody constitutes a "valuable mineral deposit.". Clearly, this activity constitutes exploration per the Mining Law of 1872 as interpreted by the courts. Clearly this activity is in violation of the Wilderness Act and Noranda's HR claims are not valid claims. Why do the Agencies continue to ignore this violation of law? (201)

Obviously, Noranda is still in the process of determining if the low-grade orebody discovered after January 1, 1984 by U.S. Borax is of sufficient quantity and quality to justify development. Therefore, Noranda has not discovered a "valuable mineral deposit" and has not yet satisfied the discovery test. (201)

The EIS should be revised to state more clearly that the February 27, 1985 validity determination continues to be the authority for processing and approval of the Plan of Operations. (139)

Response: The background of Noranda's mineral rights in the ore deposit they propose to develop in the Montanore proposal is discussed in the mineral rights portion of Chapter 1. As explained there, the Forest Service decided in 1985 that Borax had valid existing rights in four of the HR claims, including HR 133 and 134, the claims upon which Noranda now asserts their rights to develop. The Forest Service verified that Borax maintained these mineral rights throughout the drilling program in the mid-1980s. Currently, as part of the review of the proposed Montanore Project, the Forest Service is continuing to verify Noranda's valid existing rights. The Forest Supervisor will take into consideration whether or not Noranda has maintained valid existing rights to claims within the wilderness area when he issues the Record of Decision for the Montanore Project.

Noranda has applied to the Bureau of Land Management (BLM) for mineral patent to claims HR 133 and HR 134. The BLM has the authority to determine matters related to mineral rights and patent of mining claims. The BLM will decide, based on compliance with statutory requirements, whether Noranda's predecessor discovered a valuable mineral deposit prior to wilderness withdrawal, and whether such a discovery presently exists. While the Forest Service will provide a recommendation to BLM concerning whether or not patent should issue, and will base this recommendation on a mineral examination and written findings, that process is not part of this FEIS. The Forest Service will consider Noranda's valid existing mineral rights in preparing the Record of Decision for the proposed Montanore Project.

Mineral Report Flawed

2CV The mineral report is flawed in concluding that the Wilderness Act did not affect Borax's claim to mineralization beyond the boundaries of its claim. Forest Service must correct this error in the mineral report before approving Noranda's plan of operations. (3)

The mineral report is flawed by the Forest Service's failure to examine whether Borax's claims were properly located. (3)

We believe that the Forest Service must reexamine the validity of Noranda's mineral claim in the wilderness area before approving the proposed plan of operations. Request this examination be prepared and released to the public in a supplemental DEIS. (3)

The Forest Service cannot approve Noranda's Plan of Operations until it re-evaluates the validity of Noranda's claim as of December 31, 1983. (3)

Regardless of whether the Rock Lake Mineral Report was a final decision, we believe that the agency must prepare a new validity analysis prior to rendering a decision on Noranda's Plan of Operations. We believe that the Forest Service made at least three errors in this report. (3)

There is nothing in the mineral report that substantiates discovery except the authors assertions and vague references to Appendix B info that was never available to the public. Nowhere in the text of the report is there information that supports the assertions. Table 2, Appendix A shows values for silver that are far below ore grade and Figure 1, Appendix A shows silver values at various depths that are so far below grade as to not be marketable at a profit. (58)

Response: These comments are directed at the Rock Lake Mineral Report issued on February 27, 1985, not the Draft or Supplemental Draft EIS. As stated in the previous comment, the Forest Service is again considering Noranda's valid existing rights as part of the review of the proposed Montanore Project. The 1985 Mineral Report will provide background information and analysis useful to the Forest Service in reviewing valid existing rights. In addition, the Forest Service will consider issues such as those raised by the public set forth above. However, analysis of valid existing rights is not part of the NEPA analysis for the Montanore proposal and therefore is not included in this FEIS.

Claims Not Properly Located

3CV Claims HR 133 and 134 are the basis for the current mining operation. However, they overlapped previous claims HR 73 and HR 74. Montana mining law would make these claims void, thus invalidating the proposed mine. (33, 86, 126, 162)

Response: Montana law allows claimants to amend or relocate claims. The Forest Service will consider this issue in its review of valid existing rights for the Montanore proposal, and in its recommendation to BLM on whether to contest the claims as part of the patent proceeding. Ultimately, as part of the patent application process, BLM will decide whether the claims are valid or should be contested for this or other reasons.

Extralateral Rights

4CV The Wilderness Act clearly provides that claims staked in wilderness areas during the "window" between passage of the Act and withdrawal of the areas from the mining laws will be limited to "the mineral deposits within the claim." By its plain terms, the Act prohibited Borax from establishing any right to mineralization beyond its claims. (3)

Noranda can claim this ore body only through extralateral rights doctrine of the 1872 Mining Law. In order to assert extralateral rights, Noranda must have valid mining claims. Noranda's claims on Rock Lake fail to meet the requirements of the extralateral rights doctrine. (33, 51, 86, 94)

The 'Apex' provision of the 1872 Mining Law should not apply to stratabound mineral deposits because such deposits are neither 'discrete' nor 'continuous' under the meaning of the law. (128)

The ore that Noranda proposes to mine pursuant to this Permit Application does not lie within boundaries of any of the claims located at Rock Lake. (33, 51, 94)

Response: As discussed in the mineral rights portion of Chapter 1, the Forest Service determined in 1985 that extralateral rights to the ore body extend from within mining claims HR 133 and 134. The Forest Service will consider the presence and extent of these extralateral rights in its review of valid existing rights for the Montanore proposal, and in its recommendation to BLM as part of the patent proceeding.

Foreign Ownership

5CV The government may summarily challenge mining claimants who have a foreign ownership (Noranda is a Canadian Corp); as aliens do not have rights under our mining laws. (58)

Response: The Noranda Minerals Corporation is incorporated under the laws of the state of Delaware. Proof of incorporation under the laws of a state establishes the citizenship of a corporation for the purpose of the Mining Law of 1872. In re Pacific Coast Molybdenum Co., 75 IBLA 16 (1983).

NEPA/Public Involvement

6CV A supplemental DEIS should be issued that clearly states the Forest Service's conclusions as to the validity of Noranda's claims and describes all the data, analysis, methods, inferences, and other information upon which the Forest Service relied in reaching its conclusion. The DEIS should also include the dates on which such information was collected as well as the dates on which decisions relevant to the validity of Noranda's claims were rendered. (3)

Notices of these actions never appeared in the Kootenai Valley Western news, they were published in the Sanders County Ledger and did not inform us in Libby that these actions would impact our lives. Since the proposal was approached from the Rock Creek side of the Cabinet Mtns until the initial hurdles were crossed, this community did not know it was being threatened. Now we are talking about Ramsey Creek, Little Cherry Creek, Poorman Creek, Libby Creek, and the Kootenai River being impacted by the discovery question, and the withdrawal from all appropriations in the Cabinet Mountains. When these questions were relevant we were not informed. This process has been flawed from the beginning. (58)

NEPA mandates the FS to consider the impacts of agency actions and to investigate points brought to light by the public. When will these matters be considered on the merits? (58)

Believe that it is important for the EIS to clarify to the public that: 1. The EIS does not purport to determine the validity of Noranda's claims; 2. For purposes of processing and approving the plan of Operations proposed by Noranda (which action is the subject of the EIS), the existence of Noranda's "valid existing rights" was established by the 1985 Validity Determination, a separate and distinct federal action; 3.The EIS provides a summary of the history and content of the 1985 Validity Determination solely as a means of explaining that the validity of Noranda's claims and its rights to conduct operations within CMW has previously been determined; and 4. An analysis or determination of claim validity is not properly part of the EIS process. (139)

It is extremely important to clarify that the FS is not conducting a new analysis or determination of claim validity and that the 1985 Validity Determination continues as the authority for the processing and approval of the subject Plan of Operations. (139)

As clearly demonstrated in the ASARCO appeal, the analysis and determination of claim validity is separate and distinct matter; they have no place in the processing and approval of specific Plans of Operations or in EPA documents relating thereto. Clarification of such matters in the EIS may serve to avoid unfounded, expensive and time consuming appeals, such as the ASARCO appeal. (139)

It would be inappropriate to analyze the validity of Noranda's claims as part of the EIS process. An EIS cannot serve to analyze or determine the validity of Noranda's claims because that function has not been delegated to the Forest Supervisor, the official responsible for approval of Plans of Operation and related EIS documents. (139)

We believe that the EIS should clarify that it was the 1985 Validity Determination, and not the Mineral Report, that formally determined the existence of Borax's "valid existing rights" and that authorized the processing and approval of all subsequent Plans of Operation. (139)

The EIS should be revised to clarify that the February 27, 1985 validity determination was the authority for verifying that Noranda has "valid existing rights", and that that determination is a separate and distinct federal action. The EIS does not purport to determine the validity of Noranda's claims, nor its rights to conduct operations within the CMW; such a determination is not a proper part of the EIS process. (139)

Response: The EIS presents a discussion on mineral rights for background purposes only. The presence and extent of mineral rights is not part of the proposed action for this EIS and is not considered at length in the alternatives or effects portions of this EIS.Under the mining laws, it is the action of a mining claimant making a valid location and making a discovery that vests the claimant with certain rights. No action by the government is required for a mining claimant to accrue rights under the mining laws. The validity process merely confirms whether a mining claimant has made a valid location and a discovery. Through a validity determination, the Forest Service is not making an irretrievable commitment of resources, nor is it conferring development rights upon the claimant. The validity process merely seeks to confirm the existence of a statutory right, not confer a right upon a person in the first instance. Thus, although the Forest Service will form an opinion as to whether the actions taken by Borax and Noranda have resulted in Noranda obtaining mineral rights to HR 133 and 134, and the extent of those rights, this opinion is not part of the NEPA review and analysis.

Other Claims Overlying Deposit

7CV At column 2, page 4, the DEIS notes that Borax located 202 lode mining claims within the CMW. 198 claims were found to be invalid. We do not believe that it is proper or correct to state that the 198 claims have been found to be invalid. We are not aware of any express statement in the Mineral Report that the

198 claims are invalid. For purposes of authorizing the processing and approval of Plans of Operation, a determination of claim validity may only be made by the Regional Forester. The 1985 Validity Determination issued by the Regional Forester makes no mention of the 198 claims. (139)

Determinations of claim validity are made by the Forest Service solely for purposes of determining whether to process and approve proposed Plans of Operation within wilderness areas. A negative determination in connection with such a review does not result in invalidation of the claims at issue. (139)

Do not believe that it is important to reference or discuss the 198 claims in the EIS. Operations proposed by Noranda will be conducted based solely upon rights derived from the claims determined to be valid by the 1985 Validity Determination. Accordingly, we recommend that all discussion of and references to the other 198 claims be deleted from the EIS. (139)

Response: The Forest Service's 1985 mineral report concluded that none of the remaining 198 HR claims had exposures of valuable mineral deposits within their boundaries. However, the Regional Forester's Feb. 28, 1985 decision did not address these other claims. Since Noranda bases all its rights to mine the ore deposit in question on HR 133 and 134, the Forest Service is not reviewing the status of the remaining 198 rights at this time.

Patent Application

8CV Questions the mineral patents near Rock Lake under the 1964 Wilderness Act. Where is this patent application considered in the DEIS? What are the expected impacts of these patents? What are the cumulative effects? Why aren't these pending patent applications addressed in the DEIS? (210)

What is the effect of patented mining claims on Rock Lake? He is not convinced adequate measures are being taken to monitor and protect Rock Lake. This is especially a concern given the DEIS ' failure to discuss the possible implications of Rock Lake area patents. (210)

Response: The mineral rights portion of Chapter 1 of has been revised in the FEIS to include a discussion of Noranda's mining claim patent application. The *Biological Assessment* in Appendix C of the FEIS considers potential effects on grizzly bears related to possible patenting of claims. Alternatives 2 and 3 include requirements that any patented land either be deeded to the Forest Service at the end of operations, or that Noranda obtain a conservation easement to ensure these lands are protected for grizzly bear use.

Marketability

9CV Has a marketability test been performed at current copper and silver prices? Have higher capital, operating, environmental and reclamation costs than those of 1985 been factored into this analysis? What is the Forest Service's conclusion as to validity today based on these factors? The Forest Service is sacrificing environmental considerations in the interest of economics. (51)

Response: The marketability is one aspect of discovery which the Forest Service will consider in its review of valid existing rights for the Montanore Project and in its recommendations to the BLM on whether to issue patent.

AIR QUALITY

1AQ Class 1 air quality laws apply in Wilderness areas. CRG has requested the agencies to look into this issue in comments and during the scoping meeting. This issue was not addressed in the DEIS. (126, 123, 153)

Response: The *Air Quality* section in Chapter 4 discusses the expected impacts to the Cabinet Mountains Wilderness. In the section, the Class 1 airshed of the wilderness is discussed.

2AQ The DEIS does address the secondary impacts of the project to the air quality of Libby, Montana. Libby is presently a Group I area for PM-10 and it is in violation of the PM-10 NAAQS. The predicted increase of PM-10 from the Montanore Project from 256 μ/m^3 to 270 μ/m^3 is unacceptable and is in direct conflict with the PM-10 State Implementation Plan (SIP) that the State of Montana is developing. The Montanore Project should develop offsets to their PM-10 emissions, so that there is no net increase in the PM-10 concentrations to the Libby area. (85, 123)

Response: The reference in the DEIS to an increase in PM-10 levels from 256 $\mu g/m^3$ to 270 $\mu g/m^3$ due to secondary impacts in Libby (p. 169 of the DEIS) is followed by the statement "without any air pollution mitigation." It goes on to discuss the Libby Air Quality Advisory Committee and air pollution mitigation measures which are being considered to bring the area into compliance. This is part of the State Implementation Plan (SIP) process. The Air Quality Bureau's position is that, through this process, the area can be brought into compliance regardless of population changes caused by this project or other factors. As indicated in the FEIS, the direct air quality impacts on Libby would be negligible. The situation in Libby and the SIP process also are discussed in the *Air Quality* section in Chapter 4.

3AQ The DEIS states that the project will not trigger Prevention of Significant Deterioration (PSD) review, because no criteria pollutant will be emitted in excess of 250 tons per year. Emissions estimates provided in Table 6-2 appear to support this conclusion. However, the table does not indicate whether the projected emission rates are based on total potential emissions or on emissions restricted by pollution equipment or operational limitations. PSD review is triggered by construction of a "major source"—a source which has the potential to emit 250 tons per year of a criteria pollutant. (85)

If the Montanore Project becomes a major PSD source, then on-site meteorological data would be required for complex terrain analysis. (85)

The PSD increment for particulate matter has been changed to PM-10. The possibility of exceedance of either the Class I or Class II increments for PM-10, or both, is substantial. The Montana Department of Health and Environmental Sciences may not permit an air pollution source which will cause exceedance of PSD increments. (85)

Response: The emissions shown in Table 6-2 were calculated taking into account air pollution control equipment and operational limitations. These control measures are described under *Air Emissions Control Measures* in the *Air Quality* section of Chapter 4, and shown in Table 4-6. They are also discussed in the Air Quality Bureau's Preliminary Determination. The control measures and operational limitations shown in the Air Quality Bureau's Preliminary Determination (PD-AQ) would be federally enforceable because an air quality permit is required from the state. The Air Quality Bureau's revised Preliminary Determination was issued March 7, 1991 for public comment. Since no pollutant emission is estimated to exceed 250 tons per year, the project is not a major stationary source as defined under the Prevention of Significant Deterioration (PSD) regulations. Table 4-6 has been revised to list uncontrolled emission levels.

Potential promulgation of PM-10 increments would not affect this project since the particulate baseline is not triggered.

4AQ Even if it is not a major source, the project will be subject to New Source Review provisions which require demonstration that there will be no interference with attainment or maintenance of a national standard. New Source Review provisions also require that the projects air pollution emissions not be allowed to increase ambient concentrations in excess of the National Ambient Air Quality Standards (NAAQS), nor consume the PSD Class I and Class II nitrogen oxide, total suspended particulate (TSP) or the forthcoming PM-10 increment.(85)

Response: Compliance with new source review provisions is being analyzed through the state air quality permit process. Compliance with particulate (PM-10), nitrogen dioxide (NO_2), and carbon monoxide (CO) ambient air quality standards has been demonstrated and the results are summarized in Tables 4-1, 4-2 and 4-3 and in the PD-AQ.

Only NO_2 and sulfur dioxide (SO_2) emissions from this project would consume PSD increment; particulates would not consume any PSD increment. This difference is due to the fact that, under the Montana PSD regulation, particulate baseline areas are defined as the impact areas of major sources, while the baseline area is defined as the entire state for SO_2 and NO_2. There are no particulate baseline areas which would be affected by this project; therefore, there would be no increment consumption (particulate increases would become part of the baseline). SO_2 increment consumption would be minimal given the small amount of SO_2 emissions. NO_2 increment consumption is addressed in the PD-AQ and additional NO_2 information has been added to the *Air Quality* section of Chapter 4.

5AQ The paragraph summarizing air quality is misleading in that it implies that Noranda's proposal does not include air monitoring activities. As noted on page 170 of the DEIS, Noranda is proposing air monitoring as part of its proposal. (139)

Response: The air quality monitoring program presented in Appendix B was agreed to by Noranda and the Department of Health and Environmental Sciences.

6AQ The DEIS fails to discuss combined PSD increment consumption, and NAAQS impacts by the Noranda Montanore Project, proposed ASARCO Rock Creek mine project, and proposed Forest Service timber sales within the same area. If Noranda's project consumes all the PM-10 increment in the Wilderness, the ASARCO project may be foreclosed. (85)

Response: The air quality permit application review for ASARCO's proposed Rock Creek Project is ongoing. Similar to the Montanore Project, it is not a major stationary source. Therefore, there would be no particulate increment consumption. NO_2 and SO_2 increment consumption would occur from both projects, but the analysis indicates that there would not be a combined or overlapping increment consumption. NO_2 emissions from fuel burning associated with timber production would consume increment and could have a combined effect with respect to the Montanore Project. It is unlikely that these activities would consume the entire increment, but this would be reviewed on an ongoing case-by-case basis. Cumulative particulate impacts should not approach ambient standards. The *Cumulative Impacts* section under *Air Quality* has been revised to include additional discussion.

7AQ The predicted concentrations from the Plant site--and from the Libby Creek adit--will likely not cause violation of the Class II increment, may well cause violation of the Class I increment in the Wilderness. The nitrogen dioxide increment is not even discussed in the DEIS. Permit needs to include federally enforceable emission limit. A cumulative analysis of other sources in the Class area needs to be addressed. The DEIS does not include a visibility analysis to assess the visual documentation should include this analysis. (85)

Response: The VISCREEN Level 1 and 2 visibility analysis which was performed is summarized in the *Air Quality* sections of Chapters 4 and 6 and in the PD-AQ. A detailed description of the modeling analysis is included in Noranda's air permit application.

8AQ Provision must be made for reducing particulate emissions from the impoundment after closure, especially since the emissions will contain heavy metal particulates. (85)

Response: Wind erosion of tailings is a significant concern both during the operational life of the impoundment and afterward. Noranda's final reclamation plan calls for spreading an average of six inches of coarse tailings over the surface, lowering the water level, grading the surface, replacing 18-24 inches of topsoil, and revegetating the area (see *Reclamation* in the *Alternative 1* section in Chapter 2). Assuming successful reclamation, wind erosion would not occur. The respread topsoil should not contain heavy metal particulates. The initial 1 to 2 year reclamation phase or any temporary closure would be of particular concern and would be monitored closely.

9AQ Champion mill was recently fined $30,000 for polluting the air in the Libby area. Is that what the citizens thought they were going to get? How much adverse health consequences have resulted from Champions air pollution over the past 10 years; respiratory distress, infectious disease, emphysema, heart disease and lung cancer. Inversion in the winter is a disgrace and it certainly impacts on visual and aesthetic qualities of the tourism based economy. (130, 163)

Response: The existing air quality environment is described in Chapter 3. The anticipated effects to Libby area air quality from Montanore Project development is discussed in Chapter 4.

10AQ In the revised/supplemental DEIS, a detailed map showing the locations and elevations of the Class I receptors, along with stack parameters and plume rise calculations should be included. (85)

Response: Noranda's air quality permit application, on file with the agencies and area public libraries, includes the requested information.

11AQ The predicted 24 hour maximum lead concentrations for the tailings pond and the Ramsey Creek Plant are presented. This discussion should be clarified by adding a sentence that indicates that lead concentrations associated with the tailings pond and the Ramsey Creek plant site will not exceed federal and Montana ambient air standards. (139)

Response: The text in the *Air Quality* section of Chapter 4 has been revised to indicate that lead concentrations would not exceed federal and Montana ambient air standards.

12AQ The need for an upwind air quality monitoring site at the tailings impoundment is not clear. Enforcement is dependent on results of the downwind site which should be adequate. (258)

Response: The primary reason for an upwind monitoring site is to provide a means to better define air quality impact of the tailings impoundment relative to other possible sources. For example, if high readings were observed at both proposed sites, then it could be assumed that the tailings impoundment was not a significant contributor. If there was no upwind site to make that determination, it might be assumed that the impoundment was the primary contributor. Another reason is to provide better monitoring coverage of the area in the event of winds blowing opposite to the prevailing wind direction. Given the concern for potential wind erosion, the agencies determined that two monitoring sites would be necessary.

13AQ Except for a discussion on data reporting, the EPA could find no response to their questions and concerns in the SDEIS regarding those specifics outlined in our original comments of December 28, 1990. Recommends a review of those comments and discussion with them for appropriate inclusion into the Final EIS. (229)

Response: The EPA's comments have been addressed by revising the *Air Quality* sections of Chapters 3 and 4 and in the above comments. The agencies provided responses to all of EPA's comments of December 28, 1990 in a letter from the KNF to the EPA dated February 15, 1991.

WILDLIFE

Grizzly Bear Mitigation–General

1WL There is adequate room in surrounding forest areas that would more than sufficiently handle the temporary displacement of big game and other wildlife species without requiring potentially excessive special mitigation measures. The bear is provided with more than adequate habitat in surrounding areas. It is unreasonable to impose unwarranted mitigation measures for these threatened and endangered situations. (232, 260)

The current amount of recreation in the Cabinets is very low, less than FS numbers show, therefore we do not see this as a concern for grizzly mortality. The primary reason for bear mortality is the heavy-handed way the USF&W has pushed the recovery on the indigenous population with no regard for the effect to local recreation, economy, and safety of the people who live here. (110)

Response: There should be adequate room for any big game species displaced by the operation, providing the proposed mitigation measures proposed as part of Alternatives 2 and 3 are implemented.

A long-term disturbance of 20 years or more would occur in the upper Ramsey Creek drainage, influencing over 7 square miles of space. The upper basin area is adjacent to the wilderness within the core of prime grizzly habitat. Excellent year-round habitat components are present with documented use by grizzlies. Bears could be displaced from important seasonal habitat components during critical use periods. Exclusion could limit access to important food sources and have an adverse effect. If there was a real survival benefit associated with feeding in the upper Ramsey basin, bears may continue to use the area but become more susceptible to human-caused mortality.

In addition, over 1200 acres of bear habitat would be physically disturbed by project facilities, and would remain totally unavailable to bears during the project life, and perhaps for several years beyond. Almost all of this habitat is on low elevation spring range areas, which are very limited along the east Cabinet front during the critical period following den emergence. Considering the importance of high value food sources, particularly for female reproduction, the loss of habitat components could have an effect on bears which traditionally use the low elevation spring range sites in the Little Cherry Creek area.

Major activities would occur continuously along the east Cabinet front during the spring period (April 1 to June 15) throughout the life of the project. Bears that traditionally used the impacted areas would need to adjust their normal behavior patterns. Due to the magnitude of the disturbance, the duration of the disturbance, and the limited amount of spring foraging areas, this adjustment may have negative consequences for bear survival, since displaced animals may become more susceptible to human-caused mortality.

2WL The areas known as St. Paul and Wanless do not reflect actual site specific bear activities. The bear will have sufficient room for spring forage in the Cable Creek, Bear Creek, Cherry Creek and Snowshoe Creek drainages. (256)

Response: The St. Paul and Wanless areas have been delineated for purposes of the Cumulative Effects Model (CME). Each represents enough habitat to accommodate one sow grizzly and cubs. See the *Biological Assessment*, presented in Appendix C, and the CEM for further details.

3WL Mitigation for grizzly bear, or other wildlife impacts should occur for the life of the impacts. The management committee should be responsible for determining when impacts have ceased. (235)

The agencies' plan requires permanent protection or ownership of all habitat provided as mitigation, but does not recognize that the mine impacts will be temporary. The SDEIS provides no justification for this requirement of permanent protection. Lands potentially available for mitigation are not currently in federal ownership and should be available for future private use or for mitigation to offset future activities in the vicinity of the KNF. (258)

A third factor is indirect impact of increased mortality risk to grizzly bears due to long-term human population increases. The DEIS predicts that 88 of 111 needed new housing units will be located in rural Lincoln County at the beginning of operations in 1994, presumably near project area. As the local economy is "boosted" by the mining activity, additional human activity within grizzly bear habitat will be stimulated. Thus, Noranda may move on after the mine life, but the human development and population increases it facilitated will likely remain. (247)

Response: Most aspects of the mitigation plan would be in effect for the life of the impacts. Acquired lands would be managed for the best interest of the grizzly bears throughout the life of the impacts. All management would be approved by the Management Committee. The acquisition plan provides flexibility to allow the Management Committee with options for meeting the objectives. After the committee determines the project impacts have ended, the acquired lands could be used by others seeking mitigation for effects on grizzly bears, providing that acceptable conservation easements or other conditions are satisfied to protect these lands for grizzly bear use. Appendix I of the *Biological Assessment* provides details of the mitigation plan.

The demand for recreation around the project site is expected to increase along the east Cabinet front as a result of the project (see *Recreation* section in Chapter 4). Along with the increased awareness of locals hired by Noranda of the many recreational amenities adjacent to the project facility, offsite recreational activities can be expected to increase. A projected 2 percent population growth is expected to occur in the Libby area as a result of the project (See *Socioeconomics* section in Chapter 4). Trails and roads that provide access to primary attractions such as lake basins or scenic viewpoints receive a large percentage of the total use in the Cabinet Mountains Wilderness and surrounding roaded areas (Kootenai NF, Libby Ranger District recreational use files,1990). These routes would likely receive increased use. With more people entering grizzly habitat during spring, summer and fall months, certain areas would become less secure habitat. Martinka (1982), reported that in Glacier National Park, the number of bear confrontations appeared to be closely correlated with park visitations for the 1951-80 period. As more people/bear interactions occur over time, the potential for human-induced mortality increases due to removal or illegal kills. The increased recreational activity occurring in bear habitat as a result of the project could extend beyond the life of the mine, although it is extremely difficult to project the level of activity and associated impacts to the bear.

4WL The conceptual plan lacks qualification and specificity pertaining to proposed mitigation measures. These deficiencies should be corrected in the FEIS. (247)

Response: The *Biological Assessment* details the KNF's proposed mitigation plan.

5WL The project will cause unacceptably damaging pressure on the grizzly bear and hasten the demise of this endangered animal. Will also damage habitat for other wildlife. (89, 145, 200, 206)

Response: The proposed mitigation and protection measures are designed to alleviate the project effects on grizzly bears and other wildlife.

6WL We believe all mitigation packages offered in the DEIS to be inadequate. We urge you first, to deny approval to the project; if the project should be approved, to strengthen your mitigation demands on behalf of the bears. (145)

Response: The agencies feel that adequate mitigation under Alternatives 2 and 3 is presented in the FEIS.

7WL No discussion of monitoring the effects of mine development on grizzly bear populations is made. Why is there no monitoring plan for T and E species? (117)

Response: The committee responsible for administering the mitigation funds would have the option of instituting a monitoring plan. Specifically, the funds provided over the project life for an information and education position could be used instead for monitoring grizzly bear use and effects from the project.

8WL Perhaps the most callous assumption of the DEIS is the blatant and arbitrary dismissal of the indigenous wildlife and its habitat as something which can be totally ignored and "mitigated" in the future. Mitigation is not an acceptable substitute for protection. (86, 136)

The Cabinet/Yaak Ecosystem (CYE) is one of seven ecosystems delineated as essential to the future survival of the threatened grizzly bear. Require augmentation in order to maintain genetic variability. Since the Cabinet/Yaak Ecosystem (CYE) is isolated from other "island" populations and the boundaries of this "island" are continually shrinking due to activities such as timber harvesting and mining, it is highly unlikely that the bear will ever by considered as "recovered" in this ecosystem. The Montanore Project can do nothing but contribute to what seems to be the intentional extinction of the grizzly bear and its habitat. (86)

Find it hard to believe that any amount of mitigation could compensate for the direct an indirect loss of grizzly bear which will be attributable to the Montanore Project if implemented. Adequate funding for these measures is currently not available. (86)

Response: The mitigation and compensation measures included in the proposed action would minimize the effects on grizzly bears and their habitat, and in some cases may actually have additional beneficial effects. The proposed action would result in immediate and long term benefits in gaining greater public acceptance of grizzly bear management in the ecosystem through the addition of an information and education specialist. Likewise, the addition of a law enforcement position would have immediate and long term benefits through reduction in grizzly bear mortality in the area. Arguably, the addition of both these positions would actually improve the existing situation for grizzly bears beyond that needed to mitigate for direct and indirect effects of the project.

The land acquisition program should, in the long term, result in additional habitat available for grizzly bear use. Affected lands in the project area would be returned to grizzly bear use at the end of operations, in the case of lands not physically disturbed, or at the end of reclamation for lands physically disturbed. The intent of the plan is for most, if not all, of the acquired parcels to be managed for grizzly bear use in perpetuity. These lands might otherwise be developed in a manner inconsistent with bear needs. The end result should be a net gain in grizzly bear habitat over the long term. This additional habitat would be important in providing space for an increasing grizzly bear population.

The Cabinet Mountains grizzly bear study conducted during 1983-1988 concluded that the future of the population was in serious doubt, and recommended population augmentation with subadult females having no history of conflicts with humans (Kasworm, 1991). The first of four projected transplants was completed in July of 1990, and was a 4 year-old female. Conclusions regarding the success of this bear as a transplant would be premature at this point, however the bear did remain within the Cabinet Mountains from the day of release until denning, and had little, if any, reported contact with people (Kasworm, 1991). Another transplanted bear was recently released in the Cabinet Mountains.

If future proposed transplants prove to be successful, then this management technique may prove important in bolstering this threatened population. Support of the augmentation program by Noranda, both financially or otherwise, could be an important factor in maintaining public support, and also in gaining public acceptance of additional transplants above and beyond those currently scheduled. The Management Committee can determine the extent to which additional augmentation may be feasible.

9WL Montanore DEIS has failed to provide a Biological Assessment, which is essential in order to properly address the compliance requirements of the Endangered Species Act. The DEIS does not properly address the cumulative effects of the project on several threatened and endangered species and their habitat, including the grizzly bear. To postpone the preparation of a Biological Assessment is illegal and improperly denies the public an opportunity for input. (86)

Response: Impacts to wildlife were discussed in the DEIS and the Supplemental DEIS. Chapter 4, *Wildlife,* has been revised to reflect modifications to the agencies' analysis, particularly with respect to grizzly bears. The *Biological Assessment*, submitted by the KNF to the U.S. Fish and Wildlife Service, is included in Appendix C.

10WL Commenter questions the whole recovery program. Commenter disagrees that the USF&W Service can dictate what we will do on this land. If one of the children in the neighborhood gets attacked by a bear that does not know where the boundary lines are, who will be responsible? Why was this not addressed in this SDEIS? (256)

Response: The EIS is not evaluating the recovery plan developed for the grizzly population in the Cabinet Mountains. The KNF is responsible for implementing the requirements of the recovery plan and managing the forest for a recovered population as discussed in the recovery plan.

11WL This document fails to convince the National Wildlife Federation that the grizzly bear will be better off as a result of this mine. Given the precarious nature of this population and the legal requirements of the Endangered Species Act, mitigation for the project must clearly benefit the species before the Montanore Project proceeds. (206)

Response: The Endangered Species Act does not require that the grizzly bear be better off as a result of the project. The KNF is required to ensure that the Montanore Project not "jeopardize the continued existence" of the bear, and to develop conservation programs for the species. As discussed in the *Biological Assessment*, the KNF has determined the Montanore Project with the proposed mitigation plan may adversely affect the grizzly bear or its habitat. The U.S. Fish and Wildlife Service will decide if the project and proposed mitigation plan jeopardizes the continued existence of the bear.

12WL All 3 mitigation measures requested by Fish and Wildlife must be enforced:

1-Noranda should fund another game warden.

2-Noranda should fund an education and information position.

3-Land and habitat replacement must be acquired by Noranda through acquisitions, leases, & road closures.

These steps should be spelled out in the EIS. (126)

Response: These mitigations are proposed as part of Alternatives 2 and 3. They are presented in detail in the *Biological Assessment* contained in Appendix C.

Grizzly Bear Mitigation–Habitat Protection

13WL Mitigation should be performed/prepared before the first step of the project. (201, 206)

Acquisitions need to be identified and carried out before the project is allowed to begin, opening the process to the public and eliminating the need for an ongoing closed door management committee. (182)

Response: All proposed road closures, along with both positions (enforcement and information) would be in place prior to project construction. The land acquisition program would be phased in over a 6 year period, such that all mitigation lands would be in place at the time (or shortly thereafter) when actual mine operation begins.

The agencies anticipate that the Management Committee would solicit and encourage public involvement.

14WL It's more paper magic to pretend that purchasing grizzly habitat elsewhere replaces habitat. Either it is or isn't habitat. Changing or shuffling title does not create or replace that which has been taken. (200)

Although the proposed protection of private lands is a positive step and good idea, it is not a true form of mitigation. As stated in the SDEIS these acquisitions are to be made of current grizzly bear habitat. If this is true, then it is not providing additional habitat at all, but protecting habitat from potential future loss. Therefore, there is still a net loss of grizzly habitat. This conflicts with the protection and recovery of the bear and calls for additional measures to enlarge the amount of habitat available, especially in regards to the encroachment upon BMU 5. (182, 206, 249)

Response: The proposed action includes mitigation measures intended to replace or protect an equal or greater number of habitat units than affected by the operation. This would be accomplished through road closures and through a habitat acquisition program. The road closures would compensate for approximately 32 percent (248 habitat units) of the affected habitat units. The remaining 68 percent (533 habitat units) would be acquired through purchase of private lands or conservation easements. As explained in the *Biological Assessment*, acquired lands would be lands presently considered "unavailable" for grizzly bear habitat. These acquired lands would be protected from any future development incompatible with the mitigation plan.

15WL The lack of information provided in the SDEIS of the availability and suitability of habitat to be acquired, and/or protected through conservation easements, is not acceptable. This information is essential in order to make a decision on whether or not the effects of this project can be mitigated. If and when it is demonstrated that habitat is actually available, then a permit can be considered. (182)

Response: The agencies believe sufficient suitable habitat is available. General areas for acquisition are discussed in the *Biological Assessment*. To disclose particular parcels at this time could lead to inflated real estate values and would be fiscally irresponsible.

16WL The management committee designed to oversee the habitat acquisition/compensation program just provides a means of ignoring the problems mentioned above and precludes public involvement. There is no provision for a position on the management committee by a member of the local scientific community or a representative of a conservation organization. (182)

Response: The agencies anticipate that the Management Committee would solicit input and encourage public involvement. The committee would consist of supervisory personnel from the U.S. Fish and Wildlife Service, the Montana Department of Fish, Wildlife and Parks, and the KNF. Noranda would be represented on the committee, but would not be a directing member.

17WL The document lacks specificity as to the amount of money that will actually be made available to purchase land and conservation easements. There is no analysis in the document that gives the public any idea of current land values. (206)

Response: The KNF's proposed mitigation would require Noranda to purchase enough habitat to replace the affected habitat units. The management committee would have to approve all purchases proposed by Noranda. The total cost for habitat acquisition is estimated at about $4 million, based on an average cost of $2,000 per acre. The actual cost may be more or less, and would depend on a number of factors difficult to predict. A performance bond would be provided by Noranda to cover the costs of mitigation. Costs and bonding are explained in further detail in the *Biological Assessment.*

18WL Noranda and the Forest Service should consider acquiring key Plum Creek parcels in Iron Meadows, Silver Butte and Baree Creeks. However, this doesn't compensate for title transfer in Ramsey Creek. (210)

Property acquisition should be handled by the agencies, not by Noranda. Once properties are acquired, they should be administered by a qualified Agency, not by Noranda. Noranda should be required to pre-fund an account for this purpose. A requirement to have Noranda pre-fund a wildlife mitigation property acquisition account would insure that the funds for mitigation are available and would eliminate the possibility of any "foot dragging" by Noranda, regardless of Noranda's apparent aversion for spending money for wildlife mitigation, pre-funding of the land acquisition account is of critical importance. (201)

Response: The suggested parcels are situated along the east side of the Cabinet Mountains. The *Biological Assessment* states that private lands along the east side of the Cabinet Mountains should be given preference for acquisition. The Biological Assessment details acceptable options for land acquisition along with the funding procedures.

19WL After mine reclamation, we would suggest that all Noranda properties be retained by Noranda or, transferred or sold only to agencies/conservation groups which would manage the properties in the best interest of the bears. Suggest that the Kootenai National Forest expedite all grizzly bear management plans. Support any and all options which would help safeguard our wildlife legacy. (225)

Response: The KNF believes that its proposed mitigation plan meets the goals stated in this comment.

20WL There is a change in the Noranda Grizzly Bear Mitigation Plan in relation to long-term impacts. Apparently, Noranda is no longer willing to consider mitigation via transfer of title to its privately held lands or lands it may patent. In light of Noranda's apparent opposition to such a plan, it seems very likely that private lands with legal access through Forest Service lands will remain in both Libby Creek and Ramsey Creek drainages following mining. The FEIS should disclose these impacts as permanent changes to the ecosystem affecting grizzly bears and other resource values. (247)

Noranda is backing out of an original agreement to transfer title to patented lands in Ramsey Creek to the Forest service following development and reclamation. This is disturbing because Ramsey Creek drainage provided excellent grizzly and other wildlife habitat. The permanent loss of this drainage cannot be mitigated by other acquisition. (210)

Response: The mitigation plan under Alternatives 2 and 3 requires that any mill sites that Noranda might patent as a result of the Montanore Project, or mining claims that may be patented on the mineral deposit, would be managed to provide for grizzly bear use subsequent to the mining operation. This is to ensure that these lands are not developed after the mining operations for use that could be detrimental to grizzly bears. Noranda would either transfer title to the Forest Service for these lands once reclamation has been completed, or provide for a permanent conservation easement directed at protecting the lands for grizzly bear use.

21WL The agencies' plan does not address future management or mineral location on lands proposed to be transferred to the public domain. (258)

Response: Parcels which become property of the KNF would be withdrawn from mineral entry. For parcels acquired by Noranda, the management committee would require appropriate constraints. See the *Biological Assessment* for further details.

22WL Two things on Noranda's EIS from a workers point of view: Sees no reason for Noranda to pay $85000 a year to the Forest Service and why not put that money to more of an impact, the bussing of Noranda employees! (17, 131)

Thinks that any mandatory purchase of 5,000 acres to offset the land used on a valid mine claim is a bad idea. There is already too much land in our county that carries a tax free status. (5, 40, 49, 53, 54, 56, 57, 59, 62, 63, 63, 64, 65, 66, 67, 68, 72, 73, 74, 77, 84, 88, 95, 92, 99, 116, 9, 104, 107, 112, 114, 119, 129, 132, 142, 159, 165, 166, 207, 240)

Care should be taken that too many unreasonable requests could stifle the progress of the well-intentioned efforts of a successful operation. Many agencies with conflicting interests could stifle progress even more. We need one LEAD agency. (88)

Problems are being forced on Noranda in trying to bring a much needed industry to our area. This mine could eventually become an excellent asset to the economy of Lincoln County. Waste water treatment and grizzly bear problems seem to be the two prominent areas of question. (48, 62, 99, 122)

This land purchase and Grizzly bear money is nonsense. (56, 103)

Taking an unfair advantage of new business by requiring that they purchase private land as a trade off. We are sending a clear signal to would be investor's in our state. Montana will become even more depressed than it is now. This is a very poor idea. (125, 135, 150, 255)

I think that any mandatory purchase of 5,000 acres to offset the land used on a valid mining claim is a good idea. (78, 118, 124, 126)

We disagree with the habitat replacement idea in general, however we feel a conservation easement for the life of the project is appropriate and believe that this would best serve the grizzly bear if that is the objective you are trying to achieve. (110)

Response: The agencies involved in regulatory approvals and decisions have certain responsibilities in reviewing and mitigating the effects of a proposed project. Any mitigation activities required by these agencies have been determined to be necessary to carry out their responsibilities. Four agencies have primary EIS responsibilities associated with development of the Montanore Project. Each of these four agencies is a lead agency to ensure that their regulatory responsibilities are met. Mitigation for effects of the project on grizzly bears has been determined necessary to meet the requirements of the Endangered Species Act. As part of the mitigation plan, Noranda would acquire some private lands and ensure their protection for grizzly bear use. The acquisition plan provides flexibility by providing options for meeting the objectives.

23WL Lincoln County has a great percentage of public lands and every acre taken out of private ownership tilts this lopsided scale. (45, 58, 112, 110, 135)

Response: Lincoln County does have a substantial amount of public lands. To some persons, this is negative because of the lessened potential for private sector development and the potential loss for tax revenues. To others, this is positive because the land is held for the public trust and benefit. The USFS has developed a multiple use concept for the public lands so that economic activity can occur along with conservation/preservation efforts on these public lands.

24WL The most important Bear mitigation is the purchase of private land in nearby areas and this should be required as part of any permit. The mine will cause displacement of bear movement corridors for an extended period of time. (81, 158)

Response: The KNF expects that areas in close proximity would have a high priority for acquisition.

25WL The potential impact of Noranda's proposed mining facilities has been overstated in the DEIS. Even if 4, 888 acres are acquired and managed specifically for grizzly bears, there is no reason to believe that factors that have adversely affected the grizzly historically would not continue to exert a controlling influence on grizzly population numbers even without the proposed level of mining. (139)

Response: The KNF believes its proposed mitigation is the best feasible mitigation package warranted by the proposed project and predicted impacts. The KNF further believes that land acquisition would make recovery more feasible.

26WL The proposed land acquisition suggested in Alternative 2 is not supported by adequate biological and technical analysis. The only effect on land acquisition, as proposed in Alternative 2, may be to reduce the tax base of Lincoln County. There is no assurance that the acquired lands would provide long-term habitat for grizzlies. A number of the parcels suggested for acquisition are mining claims and may have mineral potential. After acquisition of these claims, there is no reason a future mining claim could not be staked and developed in these areas. The fact that minerals have been found in the past at these sites indicates that there also may be future mineral potential. (139)

Response: The *Biological Assessment* provides an adequate biological and technical analysis to support a land acquisition program, in conjunction with other mitigation requirements. Flexibility has been built into the plan to address concerns about reducing the tax base. While some parcels that might be acquired are patented mining claims, there are many others that are not. Also, some of these patented properties have either mined out their mineral reserves or are no longer valuable for mining purposes. Should any patented mining claims be considered for acquisition, the issue of mineral potential would have to be addressed. Mining claims could not be staked on these acquired lands.

27WL Habitat acquisition should be considered only as a last resort where absolutely necessary to preserve critical habitat. (139)

Response: The KNF agrees to some extent. The committee managing the mitigation funds would make decisions regarding quality and appropriateness of land acquisitions. The committee could also decide to do some improvements on existing holdings rather than acquisition. The suggested parcels are situated along the east side of the Cabinet Mountains. The Biological Assessment states that private lands along the east side of the Cabinet Mountains should be given preference for acquisition. The *Biological Assessment* details acceptable options for land acquisition along with the funding procedures.

28WL The proposed land acquisition schedule in Alternative 2 does not appear to have a sound biological basis. There is no reason to acquire all mitigation lands during the initial phase of the Montanore Project. (139)

Response: A phased-in approach is now proposed, with acquisitions completed over a six-year period. The management committee would have the option of acquiring easements as well as purchasing land outright.

29WL Lands purchased to replace lost wildlife habitat should be within the same BMU or an adjacent BMU to where impacts are occurring to be effective mitigation. (117)

Response: The KNF agrees that suitable lands close to the project area would receive top priority for acquisition. These would be lands within Bear Units 5 & 6 along the east Cabinet front. If necessary, lands in other Bear Units along the east front would be considered for acquisition. Third priority would likely fall to lands in Bear Units 5 & 6 along the west side (Bull River area), with other lands in adjacent Bear Units along the west side as lowest priority.

Grizzly Bear Mitigation-Road Closures

30WL National Forest users and hunters should not have to, in essence, pay for any portion of Noranda's wildlife mitigation obligation through additional restrictions on Forest access and reductions in hunting opportunities. (201)

Because of the uncertainty of such measures, and the need to ensure a mortality rate of zero, additional mitigation in other areas (i.e., habitat compensation, road closures) is required. The EIS must be explicit in pointing out the potential problems with the mitigation plans. (182)

The agencies should require Noranda to satisfy its wildlife mitigation obligation through habitat enhancement, acquisition of private parcels and increased augmentation of grizzly bears in expectation of a probable increase in bear mortalities due to the project. The agencies' mitigation proposal should be strengthened through a requirement for Noranda to perform more wildlife mitigation, sooner and without any reliance on road closures. Subject to the changes discussed herein, the Agencies' mitigation package should be adopted and considered to be the minimum necessary. (201)

Noranda should not be permitted to use road closures as part of wildlife mitigation. They should be required to pre-fund an account for acquisition of lands with desirable wildlife characteristics. Also require Noranda to fund an enhanced grizzly bear augmentation program. (201, 203, 245)

It seems that closing off access is your primary objective. Is it possible people control is also part of this objective? There is little in the way of data to prove that you have scientific basis for closing roads. (236)

Response: Consideration was given to using habitat acquisition as the only compensation measure for replacing or protecting habitat units. Initially, road closures were not included as part of this mitigation. This was in part due to concerns about public sensitivity about such closures, and the consequent negative public attitudes toward grizzly bear management. While recognizing this sensitivity, road closures were made part of the proposed action because they would provide significant overall benefit to grizzly bears. Road closures are a necessary part of the mitigation plan because—

- they would immediately provide replacement habitat adjacent to the affected area, and this habitat would provide components similar to those affected by the project;
- the most desirable lands targeted for acquisition may not be available. Therefore, acquisitions might actually occur in more marginal habitat, or in areas further removed from the project impacts; and
- lands available for purchase may already be effective habitat utilized by bears. Thus, even though the parcels are acquired, the gains would be more long-term in nature, and little or no short-term gain would be realized.

The Cabinet Mountains grizzly bear study conducted during 1983-1988 concluded that the future of the population was in serious doubt, and recommended population augmentation with subadult females having no history of conflicts with humans (Kasworm, 1991). The first of four projected transplants was completed in July of 1990, and was a 4 year-old female. Conclusions regarding the success of this bear as a transplant would be premature at this point, however the bear has remained within the Cabinet Mountains from the day of release until the present, and had little, if any, reported contact with people (Kasworm, 1991). Another transplanted bear was recently released in the Cabinet Mountains.

If future proposed transplants prove to be successful, then this management technique may prove important in bolstering this sensitive population. Support of the augmentation program by Noranda, both financially or otherwise, could be an important factor in maintaining public support, and also in gaining public acceptance of additional transplants above and beyond those currently scheduled. The Management Committee can determine the extent to which additional augmentation may be feasible.

31WL The agencies proposal only assigns partial habitat replacement credit to seasonal road closures, it is not shown what fraction of those units are used or how that fraction is obtained. (182)

It is not reasonable to close roads seasonally and claim full mitigation credit. Any road closure should be for the entire period that grizzlies are active. (235)

Response: Seasonal road closures are designed to compensate for lost habitat availability in low elevation areas. For example, habitat near roads would not be destroyed, but it would be less available due to increased activity and the grizzly bear's tendency to avoid these areas of activity.

Seasonal road closures are in areas used by bears during the spring. As the year progresses, bears move to higher elevations. Thus, keeping the roads closed for the entire year would provide little additional benefit to grizzly bears. See following responses.

32WL Mitigation emphasis should be placed more on habitat acquisition than road closures. Any roads constructed for this project should be closed afterwards. (210)

Consideration needs to be given to year around road closures that will be accessed by private land owners and mine claimants, i.e., the West Fisher Road. (182)

Roads proposed for closure lead to numerous active and inactive mining claims. How much use will these mining claimants demand and how much will the Kootenai feel bound to allow? (235)

The proposed road closures do not adequately protect the bear. To truly mitigate for the effects of new roads, the old roads must be obliterated and revegetated. The documents lack recognition of this fact. It appears that many of the roads slated to be closed will in fact be gated, with keys provided to many people for unknown levels of use. The National Wildlife Federation will not accept this type of closure as mitigation for creating access into currently secure areas. (206)

Response: Although several roads would be upgraded, the only new road proposed is a road around the tailings impoundment which would replace portions of Road 278. Private land owners and mining claimants are entitled to reasonable access. Motorized access on closed roads, however, regardless of presence of claims, is evaluated on a case-by-case basis. The *Biological Assessment* discusses the potential use of closed roads by mining claimants and alternatives that could be implemented if the management committee determines the road closures are not effective.

33WL The proposed mitigation makes an improper application of the effectiveness of road closures in providing habitat replacement and reduction of human-induced mortality risk. The statement that road closure methods are effective in 'closing' roads is incorrect. Human access on closed roads presents a source of bear displacement and potential for human-bear interaction and risk of mortality. This would hold true for the powerline corridor, and must also be considered in mitigation plans and explicitly addressed in the EIS. (182, 235, 244)

Response: There is some potential for mortality on closed roads, but the potential is less than on open roads since human activity is considerably lower.

34WL To say closing Bramlet and Lake Creek roads would not have an effect on most people is definitely questionable. How might people be effected or could tell me what goes through the mind of somebody who is limited because of some debilitating factor then to be further limited, restricted and sentenced to live with that decision. (218, 236, 256)

Response: Neither of these roads has been proposed for closure in the KNF's mitigation plan. The KNF realizes road closures may adversely affect other forest users. These effects are discussed in the *Wildlife* and *Recreation* sections of Chapter 4.

35WL Which of the mitigation measures has Noranda volunteered to provide and which of these measures are being imposed upon them by the overseeing agencies? (260)

Response: Noranda's proposed mitigation plan is described as part of Alternative 1; the KNF's mitigation plan is part of Alternatives 2 and 3.

36WL The .75 miles/640 acres road densities ratios in the 1987 Forest Plan should be revised or modified. It was written as a guidance not as a standard; remember? We do not generally support road closures more restrictive than the Kootenai National Forest standard of 0.75 miles of open road per square mile of habitat. (235, 244)

The three quarters a mile per square mile standard is confusing to him, how was that number arrived at? It varies from forest to forest. This makes him wonder if it is based on biological data or more voodoo science. (256)

Response: The road density standard was made part of the Forest Plan, and is designed to provide security. It has been substantiated through past formal consultations with the USF & W Service.

37WL We have too many gate closures right now on the Kootenai Forest. Why have year long gate closures to mitigate for a grizzly bear? (244, 256, 260)

Response: The KNF's grizzly bear mitigation plan was designed to mitigate adverse effects to the grizzly bear from Noranda's project in the best and most reasonable manner. Yearlong road closures are a part of the plan.

38WL There were not enough alternatives put in the SDEIS for the gate issue. (260)

The document provides essentially two alternatives for road closures in the grizzly bear mitigation plan. Under NEPA you are required to list a broad range of alternatives. (256)

Response: The issue addressed with road closures is protection of grizzly bear and their habitat. The KNF had originally considered a mitigation plan that did not include road closures. Road closures were considered necessary in order to mitigate for project effects. Numerous roads were considered by both Noranda and the KNF for seasonal and yearlong closures.

39WL Closing road 6214, 4784, and 2316 will not be considered as compensation for the Montanore Project. Why? (256)

Response: The KNF has already scheduled road 6214 for closure to help compensate for current levels of activity on the Forest. Thus, this road is not available to compensate for predicted additional losses due to the Montanore Project. Road 4784 would be closed as mitigation for Montanore if the closure on Road 6746 proves to be ineffective. Road 2316 would not need to be closed to meet road density standards until construction begins on the Montanore Project and the upper Ramsey Creek Road # 4781 is open.

40WL Restriction of public motorized travel should be modified to indicate restriction of public travel unrelated to mine activities. Vendors and mine visitors will require access. (258)

Response: The restriction on public motorized access has been revised to indicate vendors and mine visitors would require access.

41WL The agencies do not provide a statutory or regulatory basis for their rejection of this portion of Noranda's grizzly bear mitigation plan and should not disqualify the road closures from acting as a component of Noranda's mitigation plan. (258)

If the Agencies determine that habitat associated with these road closures will not provide effective replacement habitat, then the Agencies should state this determination in the FEIS. The agencies should also identify their basis for rejecting this component of Noranda's grizzly bear mitigation plan. (258)

The proposed road closures are excessive. Noranda is concerned that closure of roads in the mine area to provide bear mitigation not be excessive. An alternative to the Agency proposal would be to close the Midas Creek road on a seasonal basis. Closure of the Lower Granite Creek and Miller Creek roads would not be required. (258)

Response: The rationale for selected road closures is provided in the *Biological Assessment*. Based on professional judgement, the KNF believes that additional segments of the West Fisher Road offer better quality habitat than some of the segments proposed by Noranda. Closure of the Bramlet and Lake Creek roads would have adverse impacts on recreational use of the wilderness, and are not included in the KNF mitigation plan.

42WL The all-weather road proposed to be built will attract a large amount of road hunters and will funnel hunters into the upper Bear Creek and Libby Creek areas. What measures will be taken to handle this influx? Shouldn't measures be taken to discourage hunters from using this area. Perhaps a "no hunting" corridor should be set up along the new road route and similar facilities. Widespread area-closures might also encourage hunters to spend time elsewhere. (51)

Response: It is anticipated that the proposed road closures would alleviate this problem. It is questionable whether the KNF has the authority to establish a "no hunting" corridor.

43WL Habitat units gained per mile of road closed should reflect whether the road is a yearlong closure or a seasonal closure. Habitat gains are made only during the time the road is closed. (117)

Response: Seasonal closures are for the period when the grizzly bear uses an area. The habitat units were calculated accordingly.

44WL Road closure as a means of compensating for habitat security loss are notoriously ineffective. Both berms and gates placed at road entrances are circumvented. (108)

Response: Road closures significantly reduce human use. Although berms and locks can be circumvented, the additional law enforcement officer stipulated by the mitigation plan should help alleviate this problem.

45WL Road closures in the vicinity of the mine were to be used as grizzly habitat to mitigate for nearby areas in the BMU. Now that mining is to occur, it should be pointed out that the area which was to be mitigated for has now lost its value as habitat. A more careful analysis of cumulative effects needs to be done. (164)

Response: The Ramsey Creek Road was originally closed to help mitigate for impacts caused by ASARCO's exploration program which is now complete. Additionally, the road closures and habitat acquisition used to mitigate impacts due to the Montanore Project would prevent a cumulative habitat loss.

46WL Closing the upper Bear Creek road year long should not occur. This is the one place in the Cabinet Mtns. where those who cannot walk can go to see a spectacular view of the core of the Cabinets. We have no problem with seasonal closing but see no reason for a yearlong closure. (77, 119, 151, 220, 244)

Specifically supports the yearlong closure of Bear Creek Rd. (117)

Response: Upper Bear Creek has a large number of well documented grizzly bear sightings and is considered to be important to the grizzly bear. The current closure period is Oct.15 to June 30. As part of mitigation for the Montanore Project the closure period would be extended and run from Sept.1 to June 30. If the Management Committee decides the upper West Fisher road closure is ineffective as compensation for the Montanore Project, then the upper Bear Creek road would be closed yearlong.

47WL At a minimum, the mitigation proposed by the Agencies (Alternative 2) must be implemented. In addition it must be fully funded in advance, it must also be in place prior to the construction phase of the project. What additional measures, over and above those presented in the Draft, will be implemented to handle the high level of impact on wildlife during the construction phase? (51, 117)

Response: Construction impacts are relatively short term and are not anticipated to have any long term effects on wildlife populations. It is anticipated that the information and education program and the road closures would help offset the impacts due to construction, and would be implemented prior to construction.

48WL You have apparently developed a mathematical formula that supports your grizzly bear position. We question it's validity. No assurance changing ownership from private to federal will enhance the use of the area by grizzly bears. Where would these land acquisitions occur? If spring range is the limiting factor for the existing grizzly bear population, how do you propose to make room for more grizzly bears? If you have to triple or quadruple the number of bears, will you have to do the same for the spring range? (112, 110)

Response: Opportunities currently exist to substantially improve spring range values within the existing delineated habitat. Road closures, particularly those which limit motorized access throughout entire drainages in the spring, can be effective at reducing mortality risk. Land acquisition and/or conservation easements obtained on certain private parcels can also greatly enhance spring range habitat effectiveness. As the bear population expands, spring road closures implemented for the Montanore Project may need to be continued after project impacts to provide security for an expanding bear population.

49WL The discussion concerning mitigation associated with road closure appears to be based on faulty calculations and assumptions. The habitat units gained from road closure would be 76 per mile rather than 109 (i.e., 109-33 = 76). (139)

Response: The text concerning road closures in the *Wildlife* section of Chapter 4 has been revised accordingly.

50WL Road closure map (in the DEIS) isn't accurate. The section of road proposed for closure (Cable to Poorman) will be abandoned due to the tailings pond and moved uphill. How can you mitigate with an abandoned road closure? (24, 117)

Response: The Cable to Poorman road (6214) would not be affected by the tailings impoundment.

Grizzly Bear Mitigation–Mortality Risk Reduction

51WL Mitigating human-induced mortality risk by creating education and enforcement positions is a positive measure, but does not ensure an actual decrease in mortality risk. Such measures are important, but they cannot be relied upon to reduce mortality risks. (182)

Response: Education is intended as a long term mitigation measure for mortality risk. Enforcement is both short term and long term. Road closures would also act as both short term and long term mitigation for potential increased mortality. Both of these issues are discussed in further detail in the *Biological Assessment.*

52WL Section C21 of the Grizzly Bear Recovery Plan sets a human-induced mortality rate goal of zero. The current mortality rate in the area is stated in the SDEIS as being high, which means that measures must be taken to reduce mortality risks below present levels. The SDEIS fails to consider this and the mitigation proposals fail to reduce additional mortality risks to even the currently excessive levels. (182)

Response: As discussed in the *Road Closures* section of Chapter 2, the KNF has scheduled several roads for closure in 1992. These closures will help reduce the current mortality rate. The KNF also has an ongoing land acquisition program targeted at acquiring key parcels of land to improve bear habitat and reduce mortality risks. The KNF believes Noranda should be responsible for mitigating risks due to the Montanore Project, but not responsible for mitigating current impacts.

53WL I&E staff person would have to be employed by one of the Agencies, provides no justification or reasoning to support this modification to Noranda's plan. (258)

Response: The FEIS and the *Biological Assessment* state that the I&E staff person may be employed by one of the agencies or Noranda, but the persons' responsibilities and duties would be controlled by the Management Committee.

54WL What is the basis for the conclusion that increased mining activity will result in increased bear mortality? He cannot see the correlation. (256)

The grasses and clover planted on the disturbed areas of ASARCO's Troy Unit have proven to be frequented by black bear. It is posted 'No Hunting' and we are not aware of enforcement problems there. Have these factors been considered as they also may relate to grizzly bear? (232)

To say that increased populations will cause bear mortalities is questionable to us. If this is the case then how is it that the areas around Glacier and Yellowstone Parks do not reflect this. Is this based on biological data or is this an opinion? (223)

Response: The agencies' analysis is based on a combination of biological data and best professional judgement. Practically all recent documented grizzly bear mortality in the CYE was human induced. Also two of the three grizzly bears collared during Kasworm and Manley's (1988) study were shot. The KNF believes it is reasonable to assume that increased human/bear interactions would lead to increased grizzly bear mortality. The situation near Glacier and Yellowstone national parks is somewhat different than in the CYE. Much of the land surrounding the parks is wilderness or roadless, thus restricting access and human/bear interactions. Additionally, hunting is not allowed in the parks themselves, therefore eliminating potential for grizzly bear mortality.

The mining activity itself would probably have little effect on grizzly bear mortality. However, increased human population associated with the mine is expected to lead to increased recreational activity in the area. Martinka (1982) reported that in Glacier National Park, the number of bear confrontations appeared to be closely correlated with park visitations for the 1951-80 period. As more people/bear interactions occur over time, the potential for human-induced mortality increases due to removal or illegal kills (Ibid.). The increased recreational activity occurring in bear habitat as a result of the project could extend beyond the life of the mine, although it is extremely difficult to project the level of activity and associated impacts to the bear.

55WL The DEIS fails to point out if habitat effectiveness for grizzlies would increase back to the level of no action after project is complete. The DEIS does not address screening employees who are likely to shoot endangered or threatened species. (168)

You state human grizzly conflicts impact grizzly bear mortality - If true, backpackers, elk and black bear hunters impacts on bear mortality far exceed any impacts postulated by Noranda. In fact, the postulated increased poaching of grizzly bears is not based upon any historical bear data. (38)

Response: If reclamation is successful, habitat effectiveness should return to its pre-project level once reclamation is complete. However, if the bears have altered their use patterns, it may take some time before bear use returns to its pre-project levels. Kasworm (1988, 1987, 1986) has identified human-caused mortality as one of the main factors in the demise of the grizzly in the Cabinet Ecosystem. At a minimum, 61 known mortalities were documented from 1950 to 1990 (Kasworm, 1990). During the 1980s, most documented grizzly bear mortalities in the Cabinet-Yaak ecosystem have resulted from interactions between bears and big game hunters (Ibid.). Two of the three grizzlies radio-collared along the east Cabinet front were shot by hunters within five months of capture, illustrating the pressure of human-induced mortality on the population. One of the bears eventually recovered after receiving two body wounds from a 30.06 caliber rifle (Kasworm and Knick, 1989). Shooting mortality is of primary and immediate concern for the recovery of the Cabinet grizzly population (Ibid.). The Biological Assessment acknowledges the impact of the general big game hunting season on grizzly bear management. Regulation of hunting is the responsibility of the State of Montana.

The direct potential for increased mortality to grizzly bears exists as a result of the proposed project. Increased activities anywhere in grizzly habitat increases the potential for human-induced mortality. Grizzly mortalities could result from bears being illegally shot by employees. Several illegal shootings of big game animals occurred in the project area by subcontractors for Noranda in 1990 (Montana Dept. Fish, Wildlife, & Parks, law enforcement files). A total of 14 separate charges were brought against 5 individuals for illegally poaching 11 big game animals (Ibid). One deer appeared to have been shot and left as bear bait during the spring bear season (pers.comm., Mack Long, 1992). Three additional cases are still under investigation.

The demand for recreation around the project site is expected to increase along the east Cabinet front as a result of the project. Along with the increased awareness of locals hired by Noranda of the many recreational amenities adjacent to the project facility, offsite recreational activities can be expected to increase. A projected 2 percent population growth is expected to occur in the Libby area as a result of the project. Trails and roads that provide access to primary attractions such as lake basins or scenic viewpoints receive a large percentage of the total use in the Cabinet Mountains Wilderness and surrounding roaded areas (Kootenai NF, Libby Ranger District recreational use files,1990). These routes would likely receive increased use. With more people entering grizzly habitat during spring, summer and fall months, certain areas would become less secure habitat. Martinka (1982), reported that in Glacier National Park, the number of bear confrontations appeared to be closely correlated with park visitations for the 1951-80 period. As more people/bear interactions occur over time, the potential for human-induced mortality increases due to removal or illegal kills (Ibid.). The increased recreational activity occurring in bear habitat as a result of the project could extend beyond the life of the mine, although it is extremely difficult to project the level of activity and associated impacts to the bear.

56WL Believes that the black bear hunting season contributes to the loss of more Grizzly bears than the proposed mine ever will. Suggests closing the black bear season in these areas. (119, 115)

Suggests closure of all wilderness trails to people in the Cabinet Wilderness would be much more effective in protecting bear mortality. (38)

The Cabinets can not handle the stress of day in packers, armed with 45 automatic pistols, pushing a viable grizzly population around. Today there are hikers all over, and with the introduction of Grizzly's a lot of those hikers will be armed and nervous. (5)

Response: Human-caused grizzly bear mortality is also a function of other complicated factors, such as the regulation of big game hunting, which is beyond the authority of the Forest Service to control. Kasworm (1988) emphasizes the impact of the general big game hunting season (particularly timing) on grizzly bear management. Two of the grizzlies radio-collared in the Cabinet Mtns. were illegally shot by hunters during the fall hunting season. Since 1975, in Montana and Idaho, there have been 11 instances of grizzly bear mortality related to mistaken identity involving black bear hunters (Kasworm, 1988). Regulation of hunting is the responsibility of the State of Montana. The Biological Assessment lists measures which could be evaluated including removal of the bear tag from the sportsman license, closing the fall black bear season on October 15, and closing the spring bear season along the east Cabinet front.

57WL With only 12 bears remaining and no evidence of reproduction, increased human caused mortality of even one (1) bear could jeopardize the bear's continued existence. With the Cabinet Grizzly Bear on the verge of extinction an analysis addressing this distinct possibility must be included in any final Environmental Impact Statement. Although the proposed educational programs and addition of one enforcement officer is encouraging this will not stop poaching or unintentional killings which are the leading cause of the decline in grizzly bear populations. (108)

Response: Poaching is likely to continue with or without the mine. The mitigation plan is designed to prevent additional poaching due to increased human/bear interactions resulting from the Montanore Project.

58WL In the last ten years, the FS has closed thousands of miles of road, previously open for poachers. The need for law enforcement officers to stop poaching should be considerably reduced by now. Also, the closer you get to an operation, like the Montanore Mine, the less likely poaching is to occur. (112)

Response: Road closures are not 100% effective. As the number of road closures increases, the need for enforcement of those closures increases. Thus the KNF believes an additional law enforcement person is necessary. Additionally, it should be noted that to date there have been a total of 14 separate charges brought against 5 individuals for illegally poaching 11 big game animals in the project area by personnel hired under contract to work on the Libby Creek adit.

59WL Noranda employees and/or Noranda's contracted employees have already been guilty of game poaching violations. What can we expect when all 411 new Noranda-generated residents are turned loose around here? Believes this impact will be greater than estimated, if current practices and past experiences are any guide. Noranda should be required to specifically mitigate for poaching loss due to its employees or contracted employees actions. (16, 22)

Response: The education and law enforcement programs to be instituted as part of the grizzly bear mitigation package would be designed to discourage poaching.

60WL Except for Alt 2, alternatives do not include bear (black and grizzly) proof garbage cans which would significantly decrease possible human/bear conflicts. (168)

Response: Bear proof garbage cans would be a part of mine Alternatives 2 and 3.

Grizzly Bear Impacts–Cumulative Effects Model

61WL There are problems in the SDEIS with the use and application of the Cumulative Effects Model (CEM). The model is incomplete and does not generate sufficiently accurate data to allow for specific conclusions to be drawn (i.e., the number of habitat units lost). The data generated with the CEM omits the effects of this and other projects in the area on grizzly bears. The SDEIS fails to explicitly account for such in the description of the CEM, the presentation of the data generated, or in the conclusions drawn from that data. (182)

The postulated grizzly bear mortality risk is again only speculative and is the worst case scenario. How can you possibly speculate about about the bears mortality to the third decimal place. It's ridiculous and outrageous. This is not science, but pseudo-science! (38)

Response: Although the transmission corridor passes through BMUs which have not been mapped, the habitat components along the corridor have been mapped and the affected habitat units calculated. These calculations have been included in the analysis. The KNF agrees that the model is not complete and has dropped the analysis of habitat effectiveness and mortality risk since the meaning of the numbers generated cannot be adequately interpreted at this time.

62WL The CEM used for the SDEIS analysis does not consider cover, denning habitat, or protein sources in calculation of habitat values. The SDEIS dismissed this factor from consideration because the habitat mapping has not been completed. You cannot base a scientific analysis of habitat value solely on available huckleberries. The use of incomplete models is not only inappropriate due to its inaccuracy, but also sets a dangerous precedent for compromising the quality and accuracy of all analyses entrusted to our nation's resource management agencies. (182)

Due to the above mentioned deficiencies, CEM generated habitat values are not acceptable for use as a measurement of specific mitigation requirements. The confidence levels of CEM calculations need to be presented to reflect the true accuracy of data generated, and to allow for values to be assessed at the ends of the confidence range. Similar deficiencies exist for the determination of habitat effectiveness and mortality risk, being that they factor in habitat value, and should be treated as suggested above. (182)

Response: The available data indicate that cover is abundant in the CYE and cannot be determined to be a factor in habitat use. Therefore, cover was not incorporated into the model. There were few data regarding denning habitat when the model was prepared, and this factor was not incorporated. The KNF recognized other deficiencies associated with habitat effectiveness and mortality risks, and these indices have subsequently been dropped from the analysis.

63WL CEM should not be relied on to determine how much land or how many roads should be closed to mitigate the effects of the Montanore Project. Experienced, knowledgeable biologists should also be consulted and any errors should favor the bear. (206)

Response: The Management Committee would have the expertise of experienced, professional biologists available. The road closures selected by the KNF were selected partially on the basis of the historic use by grizzly bears.

64WL Noranda is concerned that there has been an expanded interpretation as to how the CEM relates to mitigation and compensation, particularly when the model has not been validated and there are no past policy precedents for relying on the model to determine absolute mitigation requirements. Noranda believes that the CEM is a valid method for comparing alternatives on a relative basis, but not for determining absolute environmental costs of a single proposed action. (139)

Response: Mitigation is based on the habitat unit which is one component of the model and reflects habitat quality. The KNF believes the use of habitat units is an objective way to determine mitigation.

65WL The Montanore Project is projected to remove 1,174 habitat units [based on the analysis in the DEIS]. Analysis of the data utilized in the DEIS by Noranda does not agree with this value. (139)

Response: The KNF revised this analysis. As discussed in the *Wildlife* section of Chapter 4 and the *Biological Assessment*, the KNF estimates a total of 785 habitat units would be affected by mine activities during the operation phase and an additional 562 habitat units in low elevation spring range sites during the construction phase. About 463 habitat units would be affected during the construction period by transmission line Alternative 5.

66WL Noranda disagrees with the statement about decrease in habitat effectiveness. There is no data and no technical basis to conclude that habitat effectiveness reductions have caused the near extinction of grizzly bears in the Cabinets. It is a highly questionable and unsupported assumption that the existing grizzly bear population is limited by habitat quality and quantity. Habitat limitations cannot be assumed to be affecting the size and viability of the existing population. (139)

Response: Habitat effectiveness can relate to the degree of human encroachment upon bear habitat. Access created into formerly undeveloped areas greatly increases the potential for undesirable human/bear conflicts. The number of documented grizzly mortalities in the Cabinet Ecosystem over the last few decades seems to support this conclusion.

67WL The DEIS should specifically identify these “certain areas.” What “certain areas” are referred to? The CEM assumes no reduction in habitat effectiveness due to non-motorized linear or dispersed low use which would include hunting, hiking, berry picking, and bird watching. What anticipated activities would reduce habitat security? (139)

Response: The “certain areas” are purposely not identified in order to reduce the potential for bear-human conflicts. All of the above-mentioned activities could reduce habitat security. The CEM assigns a zone of influence of 0.25 mile and a disturbance coefficient of 0.8 for non-motorized linear high use (more than one party per day). Hunting, hiking, and other forest activities probably would fall into this category.

68WL The statement about increased non-motorized activities does not appear to be consistent with the assumption in the grizzly bear CEM that non-motorized linear or dispersed low use would have no zone of influence and would have a disturbance coefficient of 1. (139)

Response: Non-motorized linear high uses are in the CEM and do decrease habitat effectiveness. Trails are non-motorized linear high use and lake basins are non-motorized points. Both have a displacement coefficient and zone of influence. Non-motorized low use activities have a zone of influence. Also see previous response.

Cumulative Impacts

69WL The title of the Cumulative Effects Model is clearly a misnomer, as used in the Montanore SDEIS. Every effort must be made to evaluate each new action with respect to former and future actions”. The SDEIS does mention the Asarco Rock Creek Project but fails to consider it in the analysis of impacts to grizzly bears. The proposed Lost Girl and other timber sales on the west side of the Cabinet Wilderness, are not addressed anywhere in the SDEIS grizzly bear analysis. This negligence is extremely dangerous to the CYE grizzly populations for 2 reasons listed below. (182)

The SDEIS does not discuss cumulative impacts on the grizzly bear stemming from both Noranda’s and ASARCO’s respective mining projects. What will the cumulative (or combined) impacts on the grizzly bear be? Why is any reference to cumulative impacts absent from the SDEIS? Can cumulative impacts be satisfactorily mitigated? (201)

The DEIS and Supplement fail in adequately addressing all human activity and subsequent impacts cumulatively in the CYE, and specifically the MP study area. The Montanore Project poses another high hurdle to be cleared for recovery of the Grizzly in the Cabinet-Yaak. These two projects are now, undoubtedly, major contributing factors to the continued decline of the bear. (246)

The Rock Creek project and the Lost Girl sale, if approved, will exacerbate the problems of habitat loss and increased mortality risk, above the already excessive levels that the Montanore Project would produce. The connection between these projects is that they will affect habitat within a single bear management unit (BMU 5). This could have a significant effect on maintaining the required 70% freely available space within each BMU. (182)

Existing information needs to be included in the EIS analysis and explicitly pointed out in the conclusions and recommendations of the lead agencies to decision makers. Failure to do this would be a violation of NEPA directives. The close proximity of the three previously mentioned projects could close the existing habitat "bottleneck" in that area. (182)

Increased activity resulting directly and indirectly from the Montanore Project will cause a further constriction of this bottleneck. When similar effects of the Rock Creek and Lost Girl proposals are considered there is a significant threat of eliminating the movement of grizzly bears through this area. (182)

The Cabinet Mountains are a thin ecosystem, the presence of human activity would displace bears creating two sub-populations north and south and interfering with the bears ability to interact in this ecosystem. (58, 119, 86)

ASARCO's Rock Creek Project will have impact on wildlife, particularly on the grizzly bear. Can the cumulative impacts of both Noranda's and ASARCO's project be mitigated? (51, 61, 153)

Response: Cumulative effects on grizzly bears have been revised and are discussed in the *Wildlife* section of Chapter 4. The Lost Girl timber sale was considered as an existing project in the *Biological Assessment*. Spatial deductions were made for this project and included in the analysis.

Construction and operation of ASARCO's Rock Creek Project, if approved, would cause a constriction of grizzly bear habitat between the two mines. This constriction would be in an area which receives heavy human recreational use particularly for berry picking. The bottleneck effect caused by this constriction could interfere with north-south grizzly bear movements and it could result in more human/bear interactions and potential bear mortality. These effects have been added to a revised discussion of cumulative effects under *Wildlife* in Chapter 4. The specific effects of the Rock Creek Project and its alternatives will be addressed in the Rock Creek EIS, which is currently being prepared. A separate grizzly bear mitigation plan as well as a Biological Assessment for the Rock Creek Project will be prepared and sent to the U.S. Fish and Wildlife Service for their biological opinion. Decisions on the Montanore Project and the Rock Creek Project will be made separately, and will be based, in part, on the biological opinions from the USFWS on each project's potential effects to grizzly bears.

Regulations governing interagency cooperation under the Endangered Species Act define "cumulative effects" as the effects of future State or Private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR Part 402). Future Federal actions are subject to the consultation requirements established in Section 7 and, therefore, are not considered cumulative for the purposes of ESA consultation requirements (USFWS, 1991). Cumulative effects of reasonably foreseeable actions, including Federal actions, are addressed in the Final Environmental Impact Statement.

70WL U.S. Fish and Wildlife Service's attempts to prematurely de-list the grizzly bear and designate it as "recovered" is not acceptable under any circumstances, and most certainly not in the name of corporate profit and resource exploitation. (86)

Response: There is no proposal to delist the grizzly bear in the Cabinets.

71WL The Habitat Effectiveness Computer model provides only a hypothetical index which is not good at predicting indirect impacts. 40 C.F.R. 1502.22 requires in such instances a full disclosure of unavailable or incomplete data and an evaluation of "reasonable foreseeable" impacts which have catastrophic consequences, even if their probability is low. (108, 85)

NEPA requires a cumulative assessment must be provided. This assessment, unlike that submitted in the DEIS, must list those specific cumulative impacts addressed in the assessment. For example, all timber sales, and their impacts, and the recent reconstruction of Highway 2 which has effectively isolated the Cabinet Grizzly from its historic interaction with Yaak populations. What constitutes a viable population and such a population's habitat requirements must be addressed. (108)

Response: The inability of the cumulative effects model to predict indirect impacts is not a matter of incomplete data but rather is a result of an inability to predict exactly where the indirect impacts would take place. Indirect impacts are considered in the analysis.

Reasonably foreseeable activities are discussed in Chapter 2 of the EIS. The cumulative effects of these activities are discussed in Chapter 4 of the EIS. Future activities requiring federal action will be evaluated if and when they are proposed and could be denied if their effects are unacceptable.

72WL Given that other mines, a ski area, and new roads and timber harvests are planned or being proposed for this same range, I believe it is vital to get protection of a much larger area. Checkerboard area to the south is not the best habitat but it will have to do. (81)

Response: The road closures and land acquisitions would protect additional land.

73WL Offended by the "lumping" together of the Selkirk/Cabinet/Yaak ecosystems, we are confused about the definition of ecosystem, the whole concept seems vague. If there are ecosystems and their boundaries are scientific, then they are two and maybe three different systems. Is this not correct? (110

Response: The Selkirk and Cabinet-Yaak are two separate ecosystems defined by the grizzly bear recovery plan. Since they are similar, one cumulative effects model has been developed for use in both ecosystems.

Grizzly Bear Impacts–General

74WL The Cabinets are not grizzly habitat. There is little evidence detailing the number of bear that can be supported in the area. I question whether a viable bear habitat can be developed in the Cabinets without a better food supply. (244, 254)

Response: The work of Kasworm and Manley (1989) suggests there is ample food and space in the Cabinets to support a recovered population. It would have 25 percent of the grizzly bear density currently occurring in Glacier National Park.

75WL The grizzly bear is not crowded for space, the agencies have estimated only 15 bears live in the Cabinets. (232, 260)

The idea to have Noranda buy bear habitat is a blatant example of govt. heavy handed tactics. This idea is a recipe for disaster and should be avoided. To proceed with the recovery program without identifying if the Cabinets are large enough to be considered for a recovery zone is ludicrous. (57, 99, 112, 119, 110, 103, 131, 133, 135, 191)

If there are only 15 estimated grizzly bears in the Cabinets, and only three of them documented to have crossed through this area, in numbers it seems we are dealing with an extremely small portion of the overall occupied grizzly bear habitat within the Cabinets. (135)

Have a problem with the Grizzly bear mitigation. Do not agree with how the Grizzly is being managed in our forest at present. The way the mitigation has to take away an unproportionate amount land and close roads, I cannot agree with. The state or federal government already has plenty of land for all things, including wilderness. Let the Black bears have this area. There are plenty of them in the Howard Lake area and also around the ASARCO mine at Troy. They had to close the road to private travel at ASARCO because of all the bear sightings. (83, 110)

Currently, the habitat in the two BMUs is above this threshold [70 percent freely available space] which further calls into question the conjecture that habitat is limiting existing grizzly bear populations. (139)

Response: The grizzly bear recovery plan for the Cabinet-Yaak Ecosystem requires the KNF to provide adequate habitat for a recovered population of approximately 70 bears in the ecosystem. Of these, 30 to 40 would inhabit the Cabinets. The Endangered Species Act requires the KNF to address the impacts to a recovered population.

76WL The Cabinet Mountains constitute the southern portion of the Cabinet-Yaak Bear Ecosystem. The area (Cabinet-Yaak) is bisected by the Kootenai River with the Cabinet portion to the south and the Yaak River portion to the north. Population consisted of approximately a dozen (12) animals. Minimal reproduction was observed during subsequent studies and the population was believed to be declining toward extinction. Only one bear has been transplanted in the Cabinets. More extensive and urgently needed recovery activities have been consistently delayed with their future implementation questionable. (108)

Response: The KNF and the U.S. Fish and Wildlife Service are proceeding with recovery efforts at a rate they believe to be politically and socially acceptable, and biologically implementable.

77WL There is no clear basis to conclude that the Cabinet-Yaak Ecosystem can, in fact, support the minimum viable population, particularly if grizzly bears do not cross the Kootenai River. It is highly unlikely that the Cabinet portion of the ecosystem could support 70 grizzly bears. (139)

Response: The grizzly bear recovery plan considers the Cabinet-Yaak Ecosystem to be an ecosystem capable of supporting 70 bears and the KNF is managing it as such.

78WL There are currently 4 bears in the whole Cabinet Mountain portion of the ecosystem. Will we truly be displacing 4 bears in an entire ecosystem for a construction timetable that will be over in less than 2 years? To say that some displacement already occurs in the area of the percolation pond and tailings impoundment because Noranda people use the road, is also without merit. In 20 years the commenter has never seen a grizzly in that area. It is difficult to believe that a small increase in vehicular traffic is affecting the bear. If there is data to substantiate this claim he would like to see it. (256)

Commenter disagrees with claim that bear use would be expected to decrease within only a quarter-mile of access roads. All the studies commenter has read dictate aversive behavior extends to at least a mile of access roads. (200)

Response: The exact number of grizzly bears currently inhabiting the Cabinet Mountains is unknown. However, reliable data indicate it is probably more than 10 and less than 15. Construction activity would cause bears to avoid roads and other areas where construction is taking place. This is particularly important during the spring when bears are using areas at low elevations. Kasworm and Manley presented data at the 1989 International bear conference which demonstrate bears avoid areas near roads and trails (see *Biological Assessment*). The data indicated that bears avoid roads more than trails, which implies avoidance is related to intensity of human use. This avoidance is due to all current activities on the roads and trails including Noranda's. Noranda's project would result in increased activity on roads especially in the upper Ramsey Creek basin. Therefore, it is believed that grizzly bears would avoid the roads more than they do now.

79WL The map on page 59 [of the DEIS] reproduced to show the effect of cutting this ecosystem in half, effectively destroying it for the free-ranging Grizzly Bear population. Closures and conservation easement will not provide the 30 mile range requirement for the bear, and will experience reproductive failure and nutritional stress. (58)

Cabinet/Yaak ecosystem is not sufficient to support the number of Grizzlies that the wildlife experts want to put in the area. (119)

Response: The grizzly bear recovery plan provides a realistic demonstration that adequate habitat is available.

80WL Reclamation [of the impoundment] with grasses and forbs will not only be successful, but will provide a low elevation spring food source that may be important to successful bear recovery. (258)

Response: The tailings impoundment area is currently forested. Reclamation to a forested state would take many years if it occurs at all. The forested habitat may be important for grizzly bear security.

81WL The most obvious short-coming of the analysis [in the SDEIS] of potential impacts on grizzly bears is the lack of consideration and incorporation of the Grizzly Bear Recovery Plan. (182)

Consideration of the state of the grizzly population must be the primary focus of his impact analysis, and needs to be addressed explicitly in the EIS. The SDEIS fails to do this. The SDEIS and the DEIS do not convey the imperiled status of the grizzly population, which is extremely critical in the Cabinet-Yaak Ecosystem. (182)

Address all potential problems with the analysis process and proposed mitigation when they are presented, in the conclusions drawn from them, and in comparison of alternatives, otherwise, decision makers will be misinformed of the true nature of the projects potential impacts, violating NEPA directives. (182)

Response: A complete analysis of impacts to grizzly bears is presented in the *Biological Assessment*, included as Appendix C in the EIS. It also includes additional discussion on the current status of the grizzly bear. The mitigation in Alternatives 2 and 3 is intended to ensure adequate habitat for a recovered population of 70 grizzly bears in the CYE as stipulated by the recovery plan.

82WL What authority is the USF&W making these mitigation demands. We could not find the specific law that enables them to make these demands. (223)

Response: Under the Endangered Species Act, the project proponent and the federal permitting agency are responsible for threatened or endangered species mitigation.

83WL The wildlife habitat will be lost and the populations adversely affected. (187)

Response: The KNF's mitigation plan is designed to compensate for lost wildlife habitat and prevent the loss of wildlife populations.

84WL Please clarify the statement that bears will be adversely impacted by the construction phase of the project, and then the admission that bears to be augmented are the primary reason for the mitigation. (223)

Response: In order to comply with the grizzly bear recovery plan, the KNF believes it must assure mitigation such that the Cabinets will be able to support a recovered population.

85WL Against proposed shuffling of bears. Commenter's experience with bears tells him they bond, like people, to certain wilderness locales and landscapes. Pages 122-123 of the Draft EIS cannot be ignored. (200)

Response: The KNF believes that grizzly bears whose home ranges include portions of the Montanore Project would continue to use their existing home ranges. However, there would be some adjustment to the amount of time spent in various portions of the home ranges due to the activity associated with the Montanore Project.

86WL Suggest that reconstruction of the Great Northern Mountain Trail under Alternative 2 be modified or even deleted, if any proposed use plan should increase human activity which would negatively impact black bear habitat and/or populations. (225)

In the case of the Great Northern trail reconstruction it should be noted that road closures described by the DEIS and road closures proposed by Noranda would create a substantial amount of "trail" similar to the Ramsey Creek road. (139)

Noranda cannot be required to reconstruct the Great Northern Trail as a part of this project. The funding for the reconstruction of the trail should be funded out of the budget of the Kootenai National Forest. (228)

Response: The plans for reconstruction of the Great Northern Mountain Trail under Alternative 2 have been dropped.

87WL The full impacts on grizzly bears will not be determined until the *Biological Assessment* has been completed. Therefore, the FEIS should disclose impacts likely to occur to grizzly bears as revealed by the *Biological Assessment*. The FEIS should also describe measures that will be taken to eliminate or reduce the adverse impacts. (238, 247)

Response: The *Biological Assessment* submitted by the KNF to the U.S. Fish and Wildlife Service is included in the FEIS as Appendix C. The FEIS also describes measures that would be taken to eliminate or reduce adverse impacts to grizzly bears.

88WL The major problem in realizing the goal of a stable population of bears in this ecosystem is the continuous shrinkage of grizzly bear habitat due to development of all kinds. (249)

Response: The KNF's mitigation plan is designed to prevent further shrinkage due to the Montanore Project.

89WL To say that 577 units will be affected in Ramsey Creek is not correct. At best only about 300 units would be affected. The 57 units lost in the tailings impoundment would be mitigated by improved habitat in the areas that will be improved for wetlands. Already the few bears in the area have become accustomed to the activity in the area. (256)

Response: Habitat units were calculated for all disturbed sites and all areas influenced in the upper Ramsey basin. Disturbance coefficients were then assigned, which reflect the degree to which habitat within each influence zone remains effectively usable by bears. A disturbance coefficient of 0.5 is interpreted to mean that the area's ability to support bears is 50% of potential; thus,either 50% of the bears have been displaced, or all bears can use the area only 50% of the time, or any combination (USFS,1988: p.10). A disturbance coefficient was then multiplied against the habitat unit average to determine actual habitat unit values affected by the disturbance. Using this process, Table 6 of the Biological Assessment indicates that 619 habitat units would be influenced in the upper Ramsey basin.

90WL Entire project falls within Management Situation 1. Seasonally, Grizzly Bears use the lowest elevations permitted by man. This suggests that the riparian vegetation of intermountain valleys is of special importance to bears. It may be assumed that maximum numbers of the Grizzly Bear can only be maintained if the species continues to have the opportunity to use both the temperate and subalpine climatic zones. (58)

There is evidence that Grizzly Bear reproductive success is tied to elevation. Females with established home ranges in low-elevation flood plain habitats have larger litters than females living in upper-elevation mountainous areas. Since the Grizzly Bear is threatened by extinction in this ecosystem it is incumbent upon the FS to protect the habitat requirements of this species. (58)

Response: All seasonal ranges are important to grizzly bears. The KNF's mitigation plan would provide adequate habitat for all seasons.

91WL Given that there is more than sufficient habitat for the existing grizzly populations, the temporary elimination of actual habitat effected by the mine and facilities will not affect the existing populations. The question of habitat adequacy for existing grizzly populations is very critical to impact analysis and mitigation because the habitat quantity and quality are the basic analysis considerations in the CEM and EIS. (139)

Response: The EIS addresses impacts to a recovered population as directed by the Endangered Species Act. The three collared bears used the entire Cabinets and areas outside of the Cabinets. Displacement from a portion of their habitat could result in greater mortality risk.

92WL If it is assumed that spring habitat currently is limiting to existing grizzly bear populations, it would have to be grossly inadequate for a future recovered population. Conversely, if spring habitat is assumed to be adequate for a future recovered population, it would have to be more than adequate for the existing small bear population in the Cabinets. (139)

Response: The KNF believes spring habitat is very limited particularly when considering the limited amount of snow-free area available to bears during the months of April and May. The KNF is currently doing several things to improve spring habitat such as road closures, land acquisition on critical spring habitat, and restricting management activities on spring range. These actions would not only improve the existing condition for bears currently using the area, but would greatly enhance spring habitat effectiveness as the population increases.

93WL The average home range size for grizzly bears in incorrect. The discussion of grizzly bear augmentation should be updated to include the transplanting of a subadult female to the Cabinet Mountains in July of 1990. (117)

Response: Average minimum home range for the three grizzly bears studied by Kasworm and Manley was 295 square miles. The text has been modified accordingly. Discussion of the grizzly bear transplanted in 1990 into the Cabinet Mountains is included in the *Biological Assessment.*

94WL Little data is available regarding grizzly bear denning habitat in the Cabinet Mountains and this should be stated (Kasworm and Manley 1988). Conclusions regarding the effects of mining in the area should reflect this. (117)

Response: Although no proposed activity would occur directly within denning habitat, blasting at the adit portal in upper Ramsey Creek during the denning period (Sept.15-Nov.30) could affect bears seeking den sites in the upper basin area. Research by Schoen and Beier (1990) on Admiralty Island documented the movement of den sites by 6 female brown bears further away from the area influenced by the Greens Creek Mine. The mean distance these bears denned from the mine site the first year of observation was 2.1 miles. They denned significantly further away from the mine site the next year with a mean distance of 7.3 miles. Once construction of the Ramsey Creek adits progresses underground, the noise from blasting should have little or no impact on bears seeking den sites in the upper basin area.

95WL Noranda questions whether the impacts from the proposed mine require a full time I&E person and whether Noranda should be solely responsible for funding such a position. (139)

Response: The information and education position would increase public awareness, and help to increase acceptance and support of grizzly bear management. Public attitudes are a major part of the success or failure of grizzly bear recovery efforts (USFWS,1990). It is crucial to the recovery effort that people understand reasons for actions in order to have a favorable attitude toward the bear. The Management Committee would decide if the Information and Education position should be continued after the first five years of the project, or whether the funds should be used instead for programs such as grizzly bear monitoring, research, and/or habitat management.

96WL The road analysis presented [in the DEIS] is outdated. (117)

Response: The text in the *Wildlife* section of Chapter 4 on effects of roads has been revised.

97WL A 26% increase in mortalities as projected by Noranda, places Noranda in the position of violating the Endangered Species Act. Recovery of this population is mandated and no level of mitigation could alleviate this loss. (58, 86)

Response: The projected increase in mortality is without mitigation. It is anticipated that the mitigation plan would prevent this increase in mortality. Due to uncertainty with these indices, the mortality risk indices were dropped from the FEIS and Biological Assessment.

98WL Is there any data regarding man/grizzly interactions. There are 4 bears in the Cabinet portion of the ecosystem. Will those bears stop every form of multiple use that occurs on the forest? She could find no data to prove that the project will harm the bear. (236)

Response: The *Wildlife* section of Chapter 3 and the KNF's *Biological Assessment* (Appendix C) discuss the current status of the grizzly bear in the Cabinet Mountains. Increased mortality resulting from man/grizzly interactions is believed to be the primary reason for the current status of the grizzly bear in the Cabinets. The *Wildlife* section of Chapter 4 and the KNF's *Biological Assessment* discuss the project effects on the grizzly.

Sensitive Species

99WL Couldn't the proposed mine be an identifiable threat to [Coeur d'Alene Salamander] populations in the project area? It would seem appropriate to address this matter more thoroughly. (246)

In Volume 5 of Noranda's Application for a Mining Permit there is a list of 43 species of wildlife of special concern said to be present in or adjacent to the study area, or historically present. Why does the DEIS superficially deal with most of these important constituents of this remarkably diverse ecosystem? (246)

My concern is that most of these species are casually brushed aside as unimportant. I don't mean to be "nitpicky," but at the very least the species listed S1, S2, or S3 ought to be given much more consideration in the EIS than they have been so far. (246)

Response: A more thorough analysis of all sensitive species is presented in the *Wildlife* section of Chapter 4. The KNF's Biological Evaluation of sensitive species is available in the KNF project record.

100WL The Kootenai National Forest's arbitrary and unsubstantiated listing of the Coeur d'Alene salamander is further proof of insufficient research into populations and habitat requirements of potentially threatened and/or endangered species. Although the salamander is considered sensitive by the Kootenai National Forest, the DEIS indicates that no significant effort was made to search for or record occurrences of this species. (86)

Response: The Coeur d'Alene salamander is a sensitive species as designated by the USFS Region 1 Regional Forester. The Coeur d'Alene salamander has been found in tributaries to Libby Creek and Bear Creek. Potential effects to the Coeur d'Alene Salamander are discussed in the *Wildlife* section of Chapter 4.

101WL The Fisher has a USFWS rating of C2. Noranda's application for a mining permit notes this species to be present adjacent to the project area, but in light of new information that it resides there should prompt a closer examination of the potential impacts of this mine on its habitat needs. If the Fisher is indeed a C2 species, that also needs to be reflected in the EIS, as the DEIS does not show that USFWS status. (246)

Response: Effects of the project on the fisher are discussed in the *Wildlife* section of Chapter 4. .

102WL The Kootenai National Forest in the forest plan indicated the mountain goat as a management indicator species. Has this project been evaluated in terms of the mountain goat management plan? What of the cumulative impacts on goats? Numerous other studies exist dealing with mining activity and its effects on mountain goats - have any of those papers been consulted by the agencies in developing the assessment of potential impacts on goats? Has any follow-up monitoring been done by the USFS, and if so, has that data been used to aid in assessing potential impacts from the Montanore Project? (246)

Eleven years ago the Troy Project warranted a detailed study of mountain goats. It doesn't appear the same interest has been exhibited for the Montanore Project. There are two short paragraphs in the DEIS and the content is vague. That's rather lame for an indicator species. (246)

Response: The KNF used new site specific information presented in Noranda's permit application as well as information available from the literature when assessing impacts to mountain goats. The assessment is based on data which indicate loud noises such as blasting may temporarily cause mountain goats to move from an area. The data also indicate that the most significant potential impact to mountain goats is new roads into or through an area inhabited by mountain goats. No such roads are proposed for the Montanore Project. Legal harvest is controlled by a permit system and mortality from this factor is unlikely to increase. The prohibition on firearms at the site stipulated in the grizzly bear mitigation plan would prevent poaching at the mine and ventilation shaft sites. Indirect impacts may occur due to increased recreational activity. This could result in some poaching.

Other Wildlife Impacts

103WL Baseline data should be prepared and the effects of heavy metals in the food chain of the Bald Eagle should be a part of the decision making process. (205, 243)

Questions have not been answered regarding mercury, cadmium, and arsenic have not been answered. Commenter believes request to cover this information in the document was ignored. Wants Kootenai NF to initiate appropriate action to make sure the Bald Eagle is protected. (205)

Response: Heavy metals are discussed in the *Surface Water Hydrology* section of Chapter 4. Most heavy metal concentrations are anticipated to be at or below detection limits in Libby Creek. Further dilution as they move downstream would indicate they are unlikely to have significant effects on bald eagles wintering on Libby Creek. Bald eagles are discussed in more detail in the *Biological Assessment.*

104WL There is no information in the DEIS on the bald eagle's nesting behavior and feels this data should be included in the draft. (260)

For an endangered species, the Bald Eagle is treated much too casually in the DEIS. I don't think you know very much about the habits and habitat needs of Bald Eagles in the MP study area. As an endangered species, much more needs to be known before a project such as this mine is implemented. (246)

Response: Bald eagles are not known to nest within the project area. Therefore, nesting bald eagles are unlikely to be affected, and the KNF believes bald eagle nesting activity is not a significant issue with regard to the Montanore Project.

105WL Is there an accepted critical habitat delineated for the Grizzly Bear and Bald Eagle. Believes this a requirement, especially if there are conflicts with proposed development. (2241)

Response: The USFWS has not delineated critical habitat for either the grizzly bear or bald eagle. A recovery zone has been delineated for the grizzly bear as part of the USFWS's Grizzly Bear Recovery Plan. Management direction for this area has been incorporated into the Kootenai National Forest Forest Plan.

106WL No alternatives mitigate for potential birds landing on toxic tailings ponds and resultant death or deformities. Mitigation should include some type of cover or deterrence. (168)

Response: As described in the *Surface Water Quality* section, it is expected that the tailings water would have very low concentrations of metals. Thus it is anticipated that the tailings impoundment would not be toxic to birds or other wildlife. Adverse effects to birds more commonly occur at operations using cyanide in desert environments.

107WL A great deal of critical moose winter range will apparently be lost to the tailings pond development. Some 800+ acres would be altered. I support Jerry's assertion that 'Noranda should not be allowed to destroy over 800 acres of moose winter range without meaningful mitigation' (246)

Response: The KNF believes closure of the Big Hoodoo Mountain Road (6747), combined with the road closures and habitat acquisitions in the grizzly bear mitigation plan, would adequately mitigate for loss of moose winter range.

108WL The FWS does not endorse the modified grizzly bear mitigation plan. The FEIS should clearly identify those agencies that endorse the modified grizzly bear mitigation plan and specifically remove FWS from that list. (247)

Response: Chapter 1 indicates that "the agencies" are the four lead agencies identified for the Montanore Project. The FEIS does not provide any inference that the U.S. Fish and Wildlife Service endorses the agencies' mitigation plan presented as a part of Alternatives 2 and 3.

109WL Calculate effects on black bear and elk and compare to impacts to Grizzly. (15)

Response: The Cumulative Effects Model is specific for grizzly bears. KNF doesn't have similar models for other species. The suggested comparison cannot be done. Effects on other big game species were evaluated in the FEIS, although models specific to these species were not used.

110WL No information is provided on what the impact of increased road kills and displacement by the project for the subsistence hunters benefit. (168)

Response: The KNF believes these impacts on wildlife populations would not be great and would have little effect on subsistence hunters. Displacement may alter the location of subsistence hunting.

111WL The proposed mine area supports one of the highest densities of Mountain Lion in Montana. It also supports critical populations of Wolf, Woodland Caribou, Bald Eagle, Falcon, Wolverines, Lynx, Grizzly Bear and Mountain Goat. The proposed project will have a significant negative impact to these critical wildlife populations. (32, 108)

Response: These effects are discussed under *Other Wildlife* in the *Wildlife* section of Chapter 4. Effects on threatened or endangered species potentially occurring in the project area are also discussed in the *Biological Assessment*.

112WL The assertion that big game "might be" affected by increased hunting and road use is an understatement. The question is not if they will be affected but how much. The EIS should present such information and make a reasonable attempt to quantify the impacts. (171)

Response: It is not certain how much effect increased hunting would have on big game. The FEIS discloses this uncertainty.

113WL To protect the elk that range in the area, I would recommend curtailing or stopping construction during hunting season. (57, 117, 110)

Response: All transmission line alternatives would cross portions of the elk security range located in the upper Miller Creek drainage. Appendix H locates areas where timing restrictions during construction would be done first to avoid impacts by completing construction in these areas, where possible, prior to the period of concern. These periods include hunting season and winter for big game animals and spring for the grizzly bear. However, the construction period will require that the agencies maintain some flexibility to address factors existing at the time of construction, including whether animals are present or not, the weather, and human use of the area. DNRC's Environmental Specifications provide for restrictions on construction to be imposed when conditions warrant.

114WL It appears that there is undue emphasis on elk, given their low population densities in the area and the relatively minor impacts that would likely to occur. The statement on page 287 [of the DEIS]: General recreation and hunting would displace wildlife is not consistent with assumptions in the CEM. (139)

Response: Most impacts to elk would likely occur along the transmission line corridor in Miller Creek (Alternatives 4 and 5), where elk populations are higher than near the plant site. Elk hunting pressure also is higher in Miller Creek. The creation of new roads is expected to create the impacts discussed under *Other Wildlife* in the *Wildlife* section of Chapter 4. The statement on page 287 [of the DEIS] referred to several species, in addition to grizzly bears. The agencies believe this statement to be true.

115WL Is there any consideration that all big game disturbances are continuous or occur on a regular basis? (139)

Response: The text in the Wildlife section of Chapter 4 has been revised to indicate the exact extent of the zone of influence would vary depending on the ability to habituate and tolerance of the wildlife species and habitat type involved. Most big game species will habituate to human activity, but non-hunted populations habituate more readily.

116WL The deer and elk population will do fine with the mining project. People that have lived in the area for a long time or have worked at W.R. Grace will be witness the the elk herd that roams the Rainy Creek drainage. Wonder what those elk were doing so close to a mine? Must not bother them too much. (83, 110)

Response: The main concern for elk populations as a result of the project are detailed in Chapter 4, and relate mainly to powerline construction in the upper Miller Creek basin. Concerns relate to access created in a non-roaded area, and construction of the line through winter range.

117WL Making bears more wary of humans is a positive impact. (139)

Response: Making bears more wary of humans is beneficial in that it should result in fewer bear-human conflicts. However, the trade-off for this is that habitat effectiveness is lowered.

118WL The increased mortality of small game species resulting from legal hunting and mortality would be insignificant. There should be consistency in conveying the magnitude and probability of potential impacts. (139)

Response: The KNF agrees that increased mortality of small game would be insignificant. The statement is made to recognize that this impact would occur. The text in the Wildlife section of Chapter 4 has been revised to clarify this point.

119WL No calving grounds shown on the map (pg. 125 [of the DEIS]) for elk, moose, deer or mountain goat have been identified at all. If these species calving grounds are inside the affected area, than a significant impact to the populations could occur. (168)

Response: Elk calving is believed to occur on Big Hoodoo Mountain and is far enough removed from the project area that no direct impacts would occur. There may be a small indirect impact to elk calving habitat. Moose and deer calve and fawn throughout the area and some of their calving and fawning habitat would be lost, particularly at the tailings impoundment. However, calving and fawning habitat is not considered to be limiting and the KNF believes there is enough secure potential moose and deer calving and fawning habitat near the project area that the projected loss would not have significant effect on moose and deer. Data on mountain goat kidding areas are few with the only confirmed kidding area being above Rock Lake. Kidding may occur in Ramsey and Libby Creek drainages, but it would be above the elevation of the project facilities so no direct impacts to kidding habitat are anticipated. Likewise, indirect impact to mountain goat kidding are not expected to be significant due to mountain goat tolerance of human activity.

120WL It is also important to identify the movement corridors of predator and prey species between calving grounds and dense forest security areas. (168)

Response: Wildlife movements tend to concentrate along ridgelines and drainage bottoms. There are no known specific movement corridors between calving grounds and security cover in the project area. Wildlife movements are dispersed.

121WL Although caribou have not recently been sighted, their status on the endangered species list necessitates that potential calving grounds be identified. When the recovery plan comes into existence (easily within the next 16 years), their habitat is not already destroyed. (168)

The woodland caribou is not listed as an endangered species in Montana by the U.S. Fish and Wildlife Service. (171)

Response: The *Wildlife* section of Chapter 3 was revised to reflect that the woodland caribou is not listed as an endangered species by the U.S. Fish and Wildlife Service. At this time, it is not expected that the Cabinets would be in a caribou recovery zone.

122WL No information is provided as to where the mixed conifer stands are for big game and T&E species. (168)

Response: A wildlife habitat map is provided in the mine permit application. Inclusion of such a map in the EIS is not essential to the analysis.

123WL The first paragraph under "Alternative 1" states that wildlife would be displaced to other areas. The fate of the displaced animals and the impacts to these "other areas" should be fully described. (171)

Response: The KNF believes there is enough secure habitat available in the project area that wildlife populations would not be affected significantly by the displacement.

124WL When the majority of a wilderness stream's flow is diverted into an artificial, revegetated channel, the natural inhabitants of the area have lost forage and living space. The overall effect is reduction in the wildlife population. Environmental detriments of a large-scale mining operation to an area of outstanding scenic beauty will displace many current recreational users, increase noise levels increase air-borne particulates. (170)

16-year project will permanently alter the area's topography. It will be a source of heavy metals in soil, surface water and ground water. The mining operation will leave behind wells accessing contaminated water. Sediment problems will become "someone else's problem" after the project has been abandoned. The cost to society of further loss of wildlife through destruction of habitat is difficult to measure, but considered by many to be incalculable. The Montanore Project is a bad deal for the wilderness, wildlife and public in general. Protective management, our--and our children's heritage. (170)

Response: The amount of habitat affected by the proposed diversion channel would be relatively small. Big game should be unaffected by lost forage since summer forage is not limiting. There would be some loss of small mammals and song birds, but this loss is not anticipated to be significant. It is expected that wildlife would return to the area once reclamation is complete.

Miscellaneous

125WL We are offended that the DEIS has so blatantly discriminated against the natural resource worker, the assumption that these workers will cause more trouble than any other group of people is offensive and we demand that it be removed from the FEIS. (110)

The concept of asking each individual company to shoulder full responsibility for every task performed in the state could explain why we are losing businesses and population is Montana. (110)

Response: These statements are not meant to reflect on the natural resource worker. Any population increase for any reason is likely to lead to increased human activity in areas used by wildlife and a concurrent increase in poaching.

126WL Cumulative impacts on wildlife do not include present potential and past mining or timber harvest on Plum Creek lands. (resultant wildlife displacement) (168)

Response: The *Cumulative Impacts* discussion in the *Wildlife* section of Chapter 4 discusses Noranda's proposed project with other reasonably foreseeable future projects. Effects by past activities would be considered baseline.

OLD GROWTH

1OG Commenter concerned over loss of old growth habitat. He has questions about of acres listed in SDEIS. (246)

It would also be an illegal action in that it would further reduce the Kootenai's old growth forest beneath the management minimum of 10%. We don't have our required 10% to begin with. (200)

Response: Table 3-25 indicates total old growth is above 10 percent in the two potentially affected timber compartments.

2OG How severe would the impacts be to species using the 330 acres of old growth that would either be lost or would lose its effectiveness as old growth? Activity in MA 13 such as timber harvest is prohibited. The disturbance of so much old growth without any replacement habitat needs to be evaluated in terms of old growth dependent species presently utilizing old growth in that timber compartment. (246)

Response: The KNF plan establishes a standard of 10 percent of the area below 5,500 feet be maintained, protected, and managed as old growth habitat. This standard is believed to provide the protection required for the continued existence of old growth dependent species. Where activities would affect designated MA 13 areas, the Forest is required to inventory the amount of old growth available within affected timber compartments and to reassign sufficient acreage to maintain the established 10 percent standard. Chapter 3 provides maps showing the location of the old growth in MA 13 in the affected timber compartments. As shown in Table 3-25, the compartments are above the 10 percent requirement. Chapter 4 discusses the impacts that the Montanore project would have on old growth and the action to reallocate replacement acreage to a protected status, depending on the alternative selected for the mine and transmission line.

SENSITIVE PLANTS

1SP The Little Cherry Creek northern beech fern population, because of its size and the regional rarity of the species, is a significant resource. This population will be destroyed under the current plans outlined in the DEIS. There is no mention of mitigation. Treatment of this problem is inadequate. (46)

Concerned with the way in which this document proposes to deal with the impacts to the sensitive plant species *Thelypteris phegopteris*. (Northern Beechfern) (216)

The proposed actions to "mitigate the impacts" to this species are biologically unsound and would set a very dangerous and undesirable precedent. (216, 253)

Transplanting this species, if attempted, should be demonstrated to be successful before eradicating a large population in the proposed tailings impoundment area. (246)

Certainly there is no evidence that the transplant sites are appropriate habitat, and monitoring for three years as proposed in the supplement draft EIS can have little bearing on the matter. Since it would be impossible to prove that the transplant sites are appropriate habitat, It is safer to assume that they are not. (216, 227, 253)

Feels that accepting Noranda's 'mitigation' plan for *Thelypteris phegopteris* would imply that protecting biological diversity on National Forest lands is simply a matter transplanting sensitive species whenever they get in the way of a development. If Noranda were to permanently protect another large natural population of *T. phegopteris* in the same area, this would be appropriate, although not necessarily sufficient, mitigation. Transplantation is not mitigation. (216)

Objects to Noranda being allowed to dig up plants from Little Cherry Creek population during summer of 1991. Believes that it is completely inappropriate to disturb this population of sensitive plants before its fate is known. Once it has been decided to sacrifice the population for the mine, then and only then can digging of the plants be justified. (216)

Northern Beechfern, we believe this species is found throughout the forest. We question your rationale for such extensive mitigation efforts. We would like to know by what authority are you requiring this mitigation effort? (223, 240)

Response: The Northern Beechfern is not found throughout the forest. Noranda and the KNF conducted extensive surveys throughout the upper Libby Creek drainage and, as the EIS indicates, found several populations of the plant. The National Forest Management Act and Forest Service regulations require the KNF to develop and implement management practices to insure that species do not become threatened or endangered, and to maintain viable populations of sensitive species. Although impacts to sensitive populations can be approved, the effects cannot result in a loss of species viability or create significant trends towards listing as a threatened or endangered species.

2SP The Northern Beechfern mitigation is careless as well. A responsible steward of the federal property would practice transplanting the ferns before agreeing to proceed with the project. (200, 227)

A professional botanist has not been part of the agency team that is evaluating the potential effects of the project on plants (See Chapter 7 or DEIS). Therefore, the agency cannot recommend any beechfern mitigation plan. (227)

Missing in both the Application and the DEIS is a complete species list of the flora to be found in these vegetation types. I would think the information should be available as to all the plants found in each type, not just the dominant ones. (246)

Instead of the proposed transplanting, it is recommended that 1) a more thorough survey be made of the area within and surrounding the Cherry Creek populations and 2) that a species management guide or conservation strategy be prepared for the species. (253)

Response: Subsequent to issuance of the Draft EIS, the Regional Forester designated the northern beechfern a sensitive species for the Northern Region. As discussed in Chapters 3 and 4, there are six known populations of northern beechfern on the KNF, with Little Cherry Creek and four other streams having large populations. Noranda conducted surveys throughout the upper Libby Creek drainage and numerous other streams with suspected habitat, and Forest Service employees conducted surveys along seven streams suspected of having suitable habitat. Four of the six KNF populations were found during this on-going survey. A professional botanist has been part of the agency team evaluating the project's potential effects.

Two mitigation plans are presented in the FEIS. Noranda's mitigation proposal, as described under Alternative 1 would involve transplanting salvaged plants from the tailings impoundment area to other sites. The agencies' proposed mitigation, as included in Alternatives 2 and 3, would require the KNF to prepare a conservation strategy that would include protecting other known northern beechfern populations on the Forest. Transplanting beechfern is not part of the agencies' mitigation plan. These mitigation plans are presented in Chapter 2 and discussed in Chapter 4.

3SP Woolgrass (*Scirpus cyperinus*):Why is this species not dealt with in the same way as the Northern Beechfern? (246)

Response: The population of woolgrass would not be affected by the proposed project. The discussion in the *Soils, Vegetation and Reclamation* section of Chapter 4 has been revised.

RECLAMATION

1RE The draft is deficient in its discussion of reclamation. Post mining management of the proposed mining facilities should be developed now, not at some point in the future.(see page 48) Noranda is obligated by law to reclaim the land it disturbs. The plan they propose will clearly not meet this obligation. (51, 52)

Wants to see the land reclaimed when the project is complete, but to his knowledge, these things are being addressed. (83)

Long term impact and reclamation have not been adequately addressed. The reclamation discussion (page 47 [in the DEIS]) do not describe these issues in any detail. (158, 163)

A post mine construction vegetative study should be done at the ASARCO Troy Project on all species from grasses to shrubs, trees and mosses. A pre-mine construction vegetative study should be done on the proposed Noranda project. (147)

Response: The efficacy and impacts of the reclamation plan have been the subject of extensive consideration and analysis by the agencies, and are discussed in the *Soils, Vegetation and Reclamation* section of Chapter 4. The agencies have determined that the reclamation plan with mitigation measures would meet applicable regulatory requirements for reclamation.

Noranda's reclamation plan described in the permit application specifically includes provisions for the continued development and modification of the plan to accommodate advances in reclamation technology and methods as they occur. However effective the current plan may be, there is no doubt that techniques would be available 15 or 20 years from now which are not available today. For this reason, flexibility in reclamation planning is necessary.

A component of the evolution of reclamation expertise specific to the Montanore Project would be experience gained in the early years during post-construction reclamation and maintenance. This would afford Noranda the opportunity to try a variety of methods and to monitor their performance. Relevant experience at other operations in the region, including, for instance, at ASARCO's Troy Project, with the rehabilitation of timber harvest areas, roads, and burns, and at research projects conducted by the National Parks Service and the U.S. Forest Service, would also afford opportunity to improve the reclamation plan for the Montanore Project. From the discussion in the reclamation plan, Noranda has demonstrated that it is well aware of the opportunities for continued development and improvement of the reclamation plan.

RECREATION

1RC The project may impair recreational opportunities like hiking, fishing, and hunting. (3, 131)

Response: The potential effects to recreational opportunity have been described in Chapter 4 under *Recreational Opportunity* in the *Recreation* section.

2RC Questions the accuracy of the data surrounding recreational use. The frequency of trail use is questioned relative to the means of data collection. The registration boxes at the trail heads are an extremely unreliable source of data relating to trail use. (32)

The recreation use of the Cabinets will be effected minimally by the mine. There are very few people who use the areas to be affected. As for activities affecting wilderness users there are already buffer zones outside the wilderness areas that we don't want or need. (110)

Response: Information reported in Table 3-28 was derived from the 1988 KNF Recreation Inventory Management Report. It was the most accurate information available on general recreational use at the time data was collected. Accurate information on dispersed recreation (Table 3-30 is difficult to obtain. The estimates contained in the EIS were obtained from the Libby Ranger District and are considered the most reliable estimates available. The KNF has hired individuals to count trail users and used this information to correlate numbers from registration boxes.

3RC The DEIS does not have a study backing up how many people do use the area for quality camping. (168)

Response: Available information on recreational use, including camping, is presented in Chapter 3.

4RC Requests that FS emphasizes the maintenance and construction of trails in the Cabinet Mtns. Prefers tax dollars spent on trails in the Cabinets rather than other areas on the forest that are not as scenic. (119)

Given the impact of the proposed mine facilities in the Libby Creek area, the Howard Lake and the Recreational Gold Panning areas should not be further developed. Instead, other recreation locations, away from the proposed mine site, should be developed and promoted to lessen the impact of the Libby Creek area. (51, 110)

We do not see any data that would make one conclude that recreation will increase in the area because the mine is there. Believe that it is improper to require expansion of the Howard Lake Campground, Leigh Lake Trailhead Parking, or any trail construction, by Noranda. These costs are probably unnecessary in the first place and improper to charge to Noranda. (112, 110)

Noranda considers it inappropriate to be called on to fund USFS public facilities where no quantifiable impact has been identified or justified. (139)

The conclusion that project development would "significantly affect Howard Lake Campground and Recreational Gold Panning Area" is not documented or substantiated by the DEIS. The amount of increased recreational use of the east side of the Cabinets is not quantified. (139)

Opposes the Leigh Lake trail improvements and Howard Lake, recreation gold panning and Great Northern trail these are just ways for the FS to fund "pet projects." (57)

Response: USFS experience has shown that recreation activity increases in the vicinity of major projects. Local recreation use in the vicinity of a major project can be expected to be much higher than the percentage of increase in the population for Lincoln County, while the percentage of increase in use of facilities further from the project will more closely mirror the percentage in population change. USFS observations are based on experience gained from such projects as large timber sales, road construction, movie productions, and construction of Noxon and Libby Dams. One significant difference between the Montanore Project and most of the other projects is the expected life of the mine. Increasing the capacity of these nearby recreation areas would help offset some of the impact. Such an increase would be mitigated by Noranda through participating in the improvements of the Recreation Gold Panning area. The proposed mitigation for Howard Lake, and the Leigh Lake trail have been dropped.

5RC Claim that the project will hurt recreation in Libby Creek drainage is absurd. What damage has the Zonolite mine had on recreation in Rainy Creek? ASARCO mine has not had a serious detrimental effect in the Lake Creek drainage. What evidence do you have that this project will be different? (57)

Cabinet Mountain Wilderness is a large area with miles of perimeter and unlimited opportunity for hiking and sightseeing. Don't believe that the project would significantly reduce this opportunity. (112, 228)

Response: As discussed in the *Recreation* section of Chapter 4, not all recreational users of the Libby Creek drainage would be affected by the project. Hikers and sightseers seeking a primitive recreational opportunity or an opportunity for solitude would likely be most affected. The *Cabinet Mountains Wilderness* section under *Recreation* in Chapter 4 describes anticipated impacts to users of the wilderness.

6RC Some estimates of hunter days of recreation should be added to the recreational use section (MDFWP, Region 1 estimates). (117)

The hunting of species other than elk should be discussed and analyzed. (171)

Response: Additional information provided by the Montana Department of Fish, Wildlife and Parks has been added to the *Recreational Uses* under the *Recreation* section of Chapter 3.

7RC We can only assume that "displaced" as utilized in this context refers to the same type of displacement assigned to the grizzly bear. In other words, recreational users will become extinct in the Ramsey Creek drainage. (86)

Response: As discussed in the *Recreation* section of Chapter 4, not all recreational users of the Libby Creek drainage would be affected by the project. Those users seeking a primitive recreational opportunity or an opportunity for solitude would likely be most affected. Other users may find the widened Bear Creek Road and the area surrounding the project facilities provide increased recreational opportunity. Access to upper Ramsey Creek above the plant site would be restricted during project operations.

8RC DEIS state that "Access to upper Ramsey Creek above the plant site would be restricted." Since the plant site lies directly adjacent to the wilderness boundary, this means that wilderness users will be denied access to federally designated wilderness lands which were set aside for the benefit and enjoyment of the people.

Restricting the use of federal lands other than for the protection of the resource or the safety of the public is against federal law. (86)

Response: Access to upper Ramsey Creek above the plant site would not be allowed during project operations. Access to the wilderness would be available via Libby or Poorman creeks.

9RC Why are you considering increased recreation and asking that Noranda improve and build better recreation facilities if this will cause more bear mortality? (110, 124)

Response: The recreation mitigation which is part of Alternatives 2 and 3 has been revised. Noranda would fund minor improvements at the Libby Creek Recreation Gold Panning Area if additional use warrants such improvements. The area is presently considered unavailable grizzly bear habitat.

10RC Attempts by Noranda to "mitigate" the destruction of recreational opportunities in the Project Area are at best a sham. These supposed "viewpoints" would be nothing more than turnouts, enabling recreational users to pull off the road and avoid being run over by one of the many Project associated vehicles which will be constantly using these roads. The "roadside tree management program" is a poorly conceived attempt to hide an audio and visual nightmare which will be evident from almost every point in or near the Project Area. (86)

Response: The agencies believe that the proposed mitigations would reduce the impacts to recreational and visual resources. Other effects, such as the visual impact of the tailings impoundment, cannot be mitigated. These unmitigated effects are discussed in the FEIS.

11RC Upper Libby Creek trail at the end of Libby Creek road past the adit site still offers solitude and will continue to offer solitude once the adit is completed as there will be little activity at the Libby adit site once the Ramsey site is completed. (139)

Response: The text under *Recreational Opportunity* in the *Recreation* section of Chapter 4 has been revised to reflect the anticipated effects to the Upper Libby Creek trail following completion of the Libby Creek adit.

12RC Noranda agrees that development of a "transportation plan" for employees which includes incentives or subsidies should be used to minimize employee traffic. The need for a busing plan is, however not substantiated in the DEIS. Noranda's wildlife/grizzly bear education program will include employee education on safe driving and wildlife avoidance. The proposed Bear Creek road improvements will be designed for the anticipated traffic levels. (139)

Response: The FEIS discusses the effects of increased traffic in the *Transportation* section. Alternatives 2 and 3 have been revised to require Noranda to develop a transportation plan designed to minimize traffic on the Bear Creek Road and parking at the plant site.

13RC Improve trails etc to allow the public to enjoy our beautiful and unique country. (119)

Response: Trail maintenance is a normal and regular part of Forest Service efforts. There are no specific trail improvements which are tied directly to Montanore mitigation efforts.

14RC The DEIS does not address a commitment to employing people who are favorable to what the Cabinet Mtn. Wilderness is there for: public enjoyment and wildlife habitat, not violence towards the living ecosystem in the name of economic gain. (168)

Response: Such a commitment is not appropriate within the scope of mitigation requirements. Mitigation of impacts on wilderness is discussed within the FEIS.

VISUAL/NOISE

1VN How much noise would be produced from these fans? Why wouldn't the fans be placed inside the adits to begin with? Noranda should be required at a minimum to install sound attenuator on all ventilation fans as suggested in the Draft. (51)

Since all permanent fans are planned to be installed underground, these mitigation measures would not effectively reduce noise levels on the surface and should not be required.

The environmental effects of fan noise are not quantified and the need for mitigation is not substantiated in the DEIS. (139)

What other measures have been investigated to minimize noise? What other methods will be used to minimize or eliminate the noise from the venting of 700,000 cubic feet per minute of mine emissions at the Libby Creek adit site? Perhaps a system of baffles near the adit entrance would also prove effective in adding to noise reduction. (51)

Wouldn't the valley topography tend to funnel noise produced from this venting down the Libby Creek valley to the north? (51)

Response: Noranda would place the fans inside the adits during mining. During the construction phase, the fans would be placed outside near the mine portals. Since the fans would be placed near the orebody, the agencies have dropped the mitigation requiring sound attenuators on the fans. The agencies have revised the analysis of noise effects presented in the *Noise* section of Chapter 4.

2VN Would not be offended by the view of the project from inside the wilderness area or outside. (57, 83, 110)

DEIS says that a number of people hike to the top of Elephant Peak and will be offended by the view. Why did you not contact me or any other people who would not be offended by the view? From 90% of the Cabinets you will never see or hear the project. (57, 110, 151)

The project will be visually pleasing. Visuals are relative to the person who is looking and all people should be given consideration when determining what is visually pleasing. (57, 110)

The mine will be an eyesore from Elephant Peak and the tailings impoundment, like that of ASARCO, will be an eyesore from wherever it can be seen. (81, 152)

Scenic vistas within the wilderness area would be scarred by project facilities, affecting viewpoints from Elephant Peak to Snowshoe Peak, and every high mountain point in between. (86)

Response: As discussed in the *Recreation* and *Visual* sections of Chapter 4, not all recreational users of the Libby Creek drainage and Cabinet Mountains Wilderness west of the proposed project area would be affected. Those users seeking a primitive recreational opportunity or an opportunity for solitude would likely be most affected.

3VN Figure D-1 is not accurate-trip to Elephant Peak would not be worth the effort; no solitude, noise and visual destruction was totally unexpected. (168)

Response: Figure D-1 accurately represents the visual effect of the plant site on the easterly view from Elephant Peak. The figure does not show parking facilities and multi-colored cars which would not blend in with the surrounding landscape. Other effects of locating the plant in Ramsey Creek, such as increased noise or decreased opportunity for solitude, are adequately described in various sections of Chapter 4.

4VN The 595-acre tailings impoundment and dam will be a permanent scar upon the land which will be visible from a large area within the Cabinet Mountains Wilderness Area, and most likely will remain so for decades after the mine has close. (86, 123)

Response: Of the four viewpoints in the Cabinet Mountains Wilderness used for analysis, the tailings impoundment would be visible only from one—Snowshoe Peak (see Table 4-38). Because of the impoundment's size and shape, it would remain incongruous with the surrounding landscape forever. Noranda has proposed a reclamation plan for the impoundment which includes the planting of grass and tree species. Long term reclamation success would be expected.

5VN The Forest Service's erroneous assumption that the impact of these visual and audio disruptions would only affect "approximately 144 persons" is without substantiation. These vague statistics were extrapolated from data based on past use levels in this area. There is no compensation for expected increases in future wilderness visits and a huge increase in recreational use days in general. (86)

Response: The basis for the estimate of approximately 144 persons climbing Elephant Peak is described in the FEIS. Significant increases in Elephant Peak climbers are not expected.

6VN The DEIS does not account for the fact that users of the wilderness area and adjacent roadless areas would be much more severely impacted by noise and visual degradation than those people who merely view the distant peaks from their motor vehicles as they drive along the major highways. (86)

Response: As discussed in the *Recreation* section of Chapter 4, users seeking a primitive recreational opportunity or an opportunity for solitude in the proximity of the project facilities would likely be displaced. The agencies concur that users travelling U.S. 2 or other roads outside the project area would be less affected than those people currently using the project area.

7VN The DEIS proposes as a mitigation measure to minimize the visual effects of the waste rock stockpile. This is not clearly defined. Most or all of the waste rock is expected to be used in dam constructions, there the stockpile is expected to be temporary; there is a limit to what can be done to visually screen or change a temporary waste rock pile. (139)

Response: The text has been revised to reflect that proposed waste rock stockpiles would be no higher than 15 feet below height of tree canopy.

8VN How might the tailing impoundment area have modifications made that would make it more congruent with the surrounding landform/landscape? How costly would this be? (120)

Response: Very little can be done to modify the design of the tailings impoundment to make it more congruent with the surrounding landform. Noranda's proposed reclamation plan includes the planting of tree and grass species on the impoundment following project completion.

9VN Will the tailing impoundment dam and tailings storage area match the surrounding landform in color as the computer retouched photo in the Draft EIS shows? (120)

Response: During operations, the tailings impoundment would be a light grey color. Following successful reclamation, the impoundment would be covered with soil and revegetated. The photograph in Appendix D simulates the view following reclamation.

10VN The visual simulation (Figure D-3) of the transmission line seems to omit the cleared path found under all such lines. (130)

Response: Trees would be cleared beneath the transmission line. The amount of tree clearing would vary depending on span length and tree and structure height. Noranda has committed to work with the agencies to optimize pole height and span length to minimize tree clearing.

11VN The visual simulation (Figure D-2) for the tailings impoundment is left unexplained: is this the ultimate embankment? (130)

Response The photo-simulation in Appendix D simulates the view following reclamation.

WILDERNESS

1WN Believes that this wilderness is of far greater value in its preserved form, and will provide a great wealth of recreational potential for generations to come. (32, 86, 168, 123, 152)

The Montanore Project should have no impact on the character of the Cabinet Mountains Wilderness because the wilderness area was originally delineated with buffer zones to protect and preserve the unique features of the area. The pre-mining disturbances have not disturbed the resources which were intended to be preserved. (153, 258)

Response: As discussed under *Cabinet Mountains Wilderness* in the *Recreation* section of Chapter 4, the wilderness attributes of the Cabinet Mountains Wilderness would be diminished at some specific locations during project operations. This diminution would decrease following project completion and subsequent reclamation.

2WN Additional insult to the Cabinet Wilderness. ASARCO will mine under the area from the west, Noranda mines in from the east, putting this sulfide garbage on the land. (4, 167)

Response: As discussed under *Cumulative Impacts* in the *Recreation* section of Chapter 4, the proposed ASARCO Rock Creek Project would have similar effects on wilderness attributes. The Rock Creek Project would not, however, be visible from any of the viewpoints identified for the Montanore Project.

3WN We can have progress and a wilderness area. The boundaries of the wilderness seem to be getting a larger buffer zone each year. We have to stop somewhere; the rules cannot continue to change. We will still have the wilderness for all to enjoy, we can have both. (125)

I am against the proposed Noranda Mining Project. The integrity of the Cabinet Mtn. Wilderness (especially the southern half) would be devastated, due to the existing noise already involved and further lack of solitude from increased construction, traffic and lights. Further lessens the positive affects of the Kootenai Accord additions. I can identify at least 7 square miles of wilderness that would be ruined for a quality primitive camping experience. Another 9-10 sq. miles of roadless would be degraded (most likely to become wilderness) for a "outstanding" primitive camping experience, and this in not addressed in the DEIS. (168)

Response: The anticipated effects of the Montanore Project on the Cabinet Mountains Wilderness and on adjacent roadless areas are described under *Recreation* in Chapter 4.

INDIAN TRIBE CONCERNS

1IT Proposal has the potential to affect the Treaty Rights of the Kootenai Tribe of Idaho in severe, negative ways over many decades. (121)

Area in question is a subsistence area for the Tribe: specifically, huckleberry gathering, big game hunting and stream fishing. The Kootenai Nation has used the area since time began, is using it today, offer adequate safeguards for our Treaty Rights. (121, 153)

Why does the DEIS fail to address the issue of the Treaty Rights of the Kootenai Nation? (121)

The concept of a mine in an area of great historical and religious significance to the Tribe, and offends our spiritual and aesthetic sensibilities utterly. (121)

This is nothing more, and we seek nothing less, than that which is required to understand the real impact upon our rights and the rights of the Kootenai Nation not only today but for the generations unborn. (121)

A mine of the magnitude proposed is incompatible with the pristine nature of the Cabinet Mountains and adverse to historic uses of the area by the Tribal people. (250)

An error exists on page S-5 of the supplement in which Tribal treaty rights are misstated. The proper wording is: In Article III of the Hellgate Treaty of 1855, the Confederated Salish and Kootenai Tribes reserved "the right to fish at all usual and accustomed places..{and} the privilege of hunting, gathering roots and berries..on open and unclaimed lands." (250)

Response: The Treaty Rights of the Kootenai Tribe were discussed in a revised Chapter 4, *Fish and Other Aquatic Life* of the SDEIS. The same discussion also is presented in the FEIS.

2IT Kootenai River is the heart and lifeblood of its continuing survival. At present we are in the process of building an experimental Sturgeon Hatchery, with the goal of restoring the legendary Kootenai Sturgeon to its rightful place, has the potential to impact the River and our hatchery program profoundly, destructively, and permanently. (121, 161)

Avoidance of additional heavy metals loading is imperative for protection of the sturgeon and the Kootenai Tribes efforts to increase the sturgeon population in Idaho. (250)

Response: While a slight increase in concentrations of several metals are projected to accompany mining, no impact from the Montanore Project is projected or expected to affect aquatic life in the Kootenai River. A discussion of the Kootenai River is found in the *Surface Water Quality* section; the *Fish and Other Aquatic Life* section discusses potential effects to sturgeon. The aquatic life biomonitoring program presented in Appendix B is designed to detect and eliminate any potential adverse impacts to aquatic life associated with this project in Libby Creek, thereby making any potential downstream effects unlikely. Dilution and increases in hardness and alkalinity downstream from the monitoring stations would additionally reduce the potential of any significant downstream effects in the Kootenai.

SOCIOECONOMICS

Employment, Population and In-migration

1SE Concern about effects of people moving into area in anticipation of employment, don't get hired, but stay (+ unemployment) Notes from public meeting (22, 36, 58, 89, 120, 137)

Socio-economic factors such as unemployment rates should be addressed in the final EIS. Unemployment has risen during similar construction projects such as the Troy project and the Libby dam. (164)

To imply that more people will move into the area due to this project and this increase will cause local and county government costs to increase is ludicrous, the hard rock impact plan is an example of how the project will improve the county and city government. Without this project there will by economic disaster for the county and city due to the lay-offs in the timber industry. (110)

A concern about increased unemployment was raised during the public meeting. In Lincoln County, the unemployment rate actually declined during the 3-year construction period of the Troy Project. In 1980, the unemployment rate increased to 15.9 percent, but this was more related to the wood products industry (high interest rates) than mining. (13)

Doesn't believe that the project will cause more unemployment. (57)

Response: There are some cases involving major project development in rural, sparsely-populated areas where persons in-migrated into an area in anticipation of employment opportunities and remained in the area even after not being hired for these anticipated jobs. In a few cases, this has caused a short-term increase in unemployment and demands on social services in these regions. However, many of these cases involve a situation where these in-migrating persons anticipated other job opportunities in the future. For example, persons moving into the Gillette, Wyoming area during the initial stages of its coal-mining boom may have stayed because there were publicly announced plans for several additional large mining projects to begin operations within the short-term. In some cases, these inmigrating persons may stay in an area because of the potential positive lifestyle or other amenities in the area. But, in almost all cases, major project development has led to decreases in unemployment rates in the area. (See, for example, the Electric Power Research Institute report "Socioeconomic Impacts of Power Plants," 1982). Economic theory has proven that economies generally move toward an equilibrium so that people will move to areas with jobs if their current location does not provide these jobs. Whether this equilibrium takes one month, one year or two years cannot be projected with any certainty, and depends upon a large number of factors. The 1984 Campbell County (Wyoming) Monitoring Report illustrates how an area moves toward equilibrium. County unemployment increased from 1980 to 1983 as economic activity slowed. Unemployment decreased in 1984, as many workers (especially construction and service workers) began leaving the area in search of jobs. With direct respect to Lincoln County, the most likely possibility for increased unemployment is not from in-migrants seeking work at Montanore, but from the potential reduction of timber employment or from a situation where timing between Troy mine closure and new mine development (Montanore or Rock Creek) leaves Troy mine workers unemployed. Both Noranda and the State Job Service can reduce the potential for unneeded in-migration through implementation of policies and public commitment to local hiring.

2SE People who choose to remain may adapt by using local resources for subsistence, exchanging services, relying on intermittent wage labor, and engaging in extra-legal enterprises. (110)

Response: Construction and mining workers are generally highly mobile and will seek work in known job locations. This helps to bring the economy to an equilibrium. Some sectors of the regional economy such as timber production will continue to be cyclical. As noted in the *Socioeconomics* section, unemployment within a one-year period ranges from 10 to 18 percent primarily because of the seasonality of the wood products industry. Unemployed persons who anticipate return to employment within a short period of time will typically be able to sustain themselves through a variety of means during their unemployment periods. These means include reliance on other family members' income, unemployment compensation, bartering or trade, or self employment (firewood collection, cottage industries, etc.).

3SE It is time to face facts about the money made from a new project like this. Some of the wages will be spent locally, mostly on food, rent, and at the local bars. Only a few people will profit from these spent wages. Most of the larger purchases will take place out of town just as they are now by the current residents. (36)

The larger and more diverse a local economy becomes, the more it will displace imports with locally provided goods and services. (259)

Response: As discussed in the *Socioeconomics* section, some level of indirect effects would accrue to the local economy from the spending of wages and direct purchases by Noranda within Lincoln County. Montanore Project development would not necessarily result in major changes in buying habits for larger purchases by Lincoln County residents.

4SE Also the term "Local Hiring" needs to be specifically defined. Now anyone with a local address is a "local." (115, 131, 147)

Response: Within the scope of this EIS, the term "local hiring" is generally intended to mean existing residents as of the time the Montanore Project is approved and permitted. Persons moving to the area between the time of operating permit acquisition and the date of their hiring would be considered in-migrants. Within the scope of the Hard Rock Impact Plan, a "local hire" is defined as a worker who has lived at the same residence or in the same community within the study area for a period of 3 months.

5SE The DEIS assumes that the area will experience population growth when in fact I believe we will be fortunate to keep our current population. A large portion of the people now are leaving the area or have already left the area. I must object to your assumption that the area will have impacts from increases in population. This project will help ease the strain on the unemployment problem some. (57, 110)

Response: As noted in the *Socioeconomics* section, the economic analysis is dependent upon a number of assumptions and analytical methods. These assumptions are based on available data and information. The population data and forecasts within the *Socioeconomics* section have been revised to reflect 1990 U.S. Census population figures and other available data.

6SE Attached is a copy of the analysis based upon the data in the DEIS and other sources. Denial of the mine development will result in a lost opportunity for at least 660 jobs in Lincoln county and potentially 1800 jobs statewide. Additional statewide income and household earnings of $152.5 million and $41 million will likely not be achieved without the development. (93, 259)

Some points and projected impacts included in the SDEIS could be expanded. Specifically, the distinction between the micro and macro economic benefits of the project. (233)

Economic impacts are more difficult to quantify, but no less important to the analysis. How many vehicles will the 450 full time employees purchase in the next 16 to 18 years and how that will impact the auto industry? The final EIS document should address the positive economic benefits of this project on a macro-economic basis. (233)

Response: The anticipated effects of the proposed project on Lincoln County are discussed in the *Socioeconomics* section of Chapter 4. The study area, defined in the *Socioeconomics* section of Chapter 3, is the southwestern portion of Lincoln County, including Libby and Troy. The effects of development on the national economy would be negligible.

7SE What benefits, if any, will accrue to the Tribe from the Montanore Mine? Affirmative action hiring at all level? Training for technical and managerial jobs? (121, 124)

Response: With 80 % local hiring (Lincoln County), impacts to areas outside the study area will be slight, if any. Specific opportunities for training are not known at this time. Noranda has committed in its response letter to the DEIS to a training program as part of its hiring policies.

8SE State Labor and Industry Department officials in Helena and Libby have indicated that Noranda should not adopt a written policy under which only local applicants would be hired. A written "local hire" policy would probably not be legal under the Equal Opportunity Laws. (139)

Response: A written "local hire" policy would be legal under the Equal Opportunity Laws.

9SE Neither in favor nor opposed to the proposed project. Would like to see every effort made to protect all resource values, should development occur. (118, 152, 214, 215)

The negative impacts of such a project on the social and economic stability of the area are more than obvious to even the casual observer. Historically, these boom-and-bust cycles result in economic depression, social disruption and degradation of the state's natural resources and beauty. (86, 153, 164, 212)

Although the Montanore Project may provide a "quick fix" for the local economy, it is not a long term solution to the economic situation which exists in Northwestern Montana. (86)

Response: As noted in the *Socioeconomics* section, the Montanore Project would affect different persons in different ways. Economies run in cycles, but generally move toward an equilibrium. The Montanore Project is one factor which will affect the timing of the cycles.

10SE Noranda will attempt to maximize local hiring as follows:

To insure a maximum participation by local job seekers Noranda will conform to the following hiring policies:

a. Employment opportunities will be initially advertised locally in Lincoln County.

b. Noranda will utilize the services of the local Job Service office for positions that can be filled by local job seekers.

c. Noranda will institute training programs for most positions and work with the local job service and community to provide maximum opportunity to local applicants. (139)

Response: This information has been included as part of Alternative 1 in Chapter 2.

11SE Noranda estimates that 45 percent of the construction work force and 80 percent of the operational jobs will be filled by local applicants. There is currently a large labor force available in Lincoln County and the local work force is particularly adaptive to mining occupations. Local hiring for the ongoing exploration adit construction is currently over 80%. (139)

Sufficient levels of skilled and unskilled workers are currently registered with the Job Service in Libby to fill most of the technical and unskilled employment needs of the Project. Due to decline in the lumber and wood products industry and the closure of the W.R. Grace Mine, enough skilled and unskilled labor exists now for the mine and construction operations. (259)

The EIS assumes the Libby Job Service's files are an accurate depiction of worker availability and experience in the area. Just because 250 applicants at the job service say they can drive an ore truck doesn't mean they can or that they are available... The employment availability analysis for this document is very limited. (130)

Response: The FEIS assumptions and data are consistent with this information. The 80 percent local hire rates are reasonable given the current status of Lincoln County.

12SE Libby and Lincoln County are certainly in the worst economic condition now than for many years. Seventeen empty business locations on Mineral Avenue. (48, 110)

Average earnings are dropping because higher paying industrial jobs are being lost. The economic base is shifting from industry to services. (259)

Today, the economic base of Lincoln County includes service and retail activities too. The tourism portion of the County's economic base is relatively weak due to the lower level of pay in these industries, and it is small because little infrastructure in place for these industries. (259)

There are some positive trade-offs with the shift away from an industrial to a service economic base, the industries are declining, average real earnings are falling, population levels are slowly decreasing, and greater levels of retirees are residing in the County. This leaves a smaller and less flexible labor force to respond to economic development and expansion needs. (259)

Response: The current status and recent trends describing economic conditions of Libby and Lincoln County are described in the *Socioeconomics* section of Chapter 3.

13SE Today, a large portion of total income is derived from unearned income sources, and most generated from sources outside the county. These sources cannot substitute for the loss of the industrial base as large amounts of public funding are derived from the performance of the County's industries. (259)

The DEIS states mining accounts for about 7% of all county employment. Since that was written, W.R. Grace has ceased operations, so their percentage is now less than 6%. Does not know quite how to compare it to the percentage of the population 65 and over; but I don't think it's unreasonable to make the assumption that the retirees contribute several times more money to the economy that does the mining industry. They create many more jobs. (137)

Response: As discussed in the *Socioeconomics* section of Chapter 3, mining is not the most significant generator of jobs in the existing Lincoln County economic environment. The mining sector is the highest paying sector in the economy, however. The *Socioeconomics* section has been revised to reflect that retirement and transfer income are becoming an increasingly important source of money in the Lincoln County economy.

14SE In the last year or two, economic research had shown that transfer payments, mostly to retired people, constitute the largest sector of this state's economy. I found no data at all on the contribution of retirees to the local economies in the EIS. I believe this was a grave oversight. (137)

Response: The major source of money within a typical economy is from wages paid to employees. These income and employment data are important measures describing the economic environment, and can be described through Federal and State data collection efforts. According to the 1990 census, approximately 55 percent of all persons in Lincoln County were working age (21-64). In the same year, about 12 percent of all persons were of traditional retirement age (age 65 and over). It is clear that most money in the Lincoln County economy is from wages. This is not to discount the importance of any income from transfer payments to retirees. This transfer and retirement income has increased in recent years and may continue to increase; transfer payments are not, however, a typical measure of economic health or productivity.

15SE Believe projections of in-migration are too low, I think estimates of indirect employment are far too high. There is some uncertainty as to the proper indirect employment multipliers. Find this last statement absurd. The decade-old data from Troy is by no means so ancient as to be useless. Research into what has happened with the same type of development in the same type of place has got to be a more valid basis on which to found assumptions. We have never heard from a state or federal agency any rationale for why a study of ASARCO/Troy can not, or should not be done. How can cumulative impacts be assessed if we don't look at what has already happened? Without such research, we consider this EIS to be insufficient for the purpose for which it is intended. (137, 147)

An analysis of, say, the last 20 years in Idaho's nearby Silver Valley or Butte, or Anaconda, would have contributed to a more meaningful socioeconomic section for this EIS. A study of how taking the mining path can affect other economic development would also have been useful. (130)

Response: A retrospective study at impacts from Troy or other projects was not within the scope of this EIS. Economic projection is not an exact science; there are many uncertainties and unknowns in any economic analysis. Methods used to make projections are described in the *Socioeconomics* section of Chapter 4; these methods are readily accepted methods. The alternative population analysis is presented in the *Socioeconomics* section is an effort to show the sensitivity of projections to unknowns. The impact monitoring effort to be initiated by Noranda and local governments as described in the Hard Rock Impact Plan would allow for impacts to be measured, and adjustments to terms of the Impact Plan to be made if necessary.

Housing

16SE The housing market figures and the conclusions drawn from them in the DEIS are also wrong. There aren't any buyers in the area. (57)

With the soft real estate and all of the unemployed carpenters, we believe housing is not a problem. (110)

Response: The housing analysis in the *Socioeconomics* section has been revised to reflect U.S. 1990 Census data. Housing sales run in cycles, and are dependent upon a large number of variables affecting local demand including interest rates, income levels and potential for increases, population migration patterns, and others. The housing analysis within the FEIS is considered reasonable given current information.

17SE It's mentioned that increased housing costs would have the greatest impact on elderly or others on fixed income. What kind of impact? Again, what happened at Troy? (137)

Response: As competition for any commodity in short supply increases, its costs tend to rise. With respect to housing, those with higher incomes, or those with the potential for higher incomes, can more easily adjust to these increases compared to persons who are living on a fixed amount such as social security income. The impact on the elderly, therefore, can range from higher rent payments and less disposable income, to complete displacement from existing residences as the housing costs become unmanageable. The agencies are unaware of any specific data on impacts from Troy. Housing needs would depend upon a number of factors, but as noted in the FEIS, it is anticipated that some new development would occur as a direct result of Montanore development.

Cumulative Effects

18SE With the phasing down of the timber industry, we need a new industry to support our people. (9, 110, 140, 153, 165, 255, 259)

The HRMIA, PTBSA, MMRA, MMLTA, and SB410 will define the taxable value of the minerals extracted from the mine and will be major source of income for the local tax base. This will, to an extent replace some of the revenue lost by timber industry cut backs. (110)

The entire socioeconomic chapter is flawed because it is based on the assumption that the current population will remain in the Libby area, This is simply not the case. (110)

Mr. Keegan (U of M) has predicted massive increases in human services with the lay-off of hundreds of timber workers. We hardly see this project as a negative part of the socioeconomic condition of the area. (110)

All studies that have been completed to date on the timber industry lay-offs have shown that the majority of workers stay in the area thinking that this is cyclical event and things will return to normal soon. This puts a tremendous strain on social services to handle this problem. (110, 136)

This problem is not confined to the timber worker alone but to every part of the community. The county will suffer from a reduced tax base and declining economy at a time when they will be obligated to provide increased services for dislocated workers. These costs could last for over a decade. (110)

One of the most significant factors to consider in the location of the Montanore Project in Lincoln County is the creation of 400 jobs and the balancing of local economy. A problem in the past is being too dependent on the timber industry. The diversification of mining jobs into our local area would help stabilize our economy and balance the tax burden in our county that is 90% federally owned. (185, 232, 259, 260)

The Noranda Montanore Project can help correct a large portion of these economic problems. Per employee earnings from the mining development are expected to be significant, over 50% higher than the average worker's pay currently in the County. (259)

With the closing of the vermiculite mine and all of the environmental pressures on the timber industry, the Noranda Project becomes more vital to the economy to the area. (221, 228)

Can we permit certain altering impacts on a minute portion of our land area to gain the overall socioeconomic benefits that it will provide to our very threatened and endangered social community structure? Would this be a reasonable trade-off? (232)

Consider the cumulative effects of all of your actions on the people who live here. When will you consider these impacts? (256)

Lincoln County's economic base can be characterized as rather unstable. Lincoln County has been very dependent upon demand for exported lumber and wood products. (259)

Please consider the cumulative effects of all of regulations on the people and wildlife that resides here. The social and economic changes, changes in culture, and the limiting of access are good examples of the cumulative effects we are currently suffering from. Why is this not addressed? This would in fact achieve the balance you are striving for. (236)

Throughout the Pacific Northwest, forest management practices are under scrutiny and allowed timber harvests from federal lands are anticipated to decrease. (259)

Overall impact on the local economy may better stated in terms of the degree of labor force retention, not in the level of the new inmigrating population. (259)

The existing job losses due to the closure of the W.R. Grace vermiculite mine, coupled with the projected loss of jobs in the wood products industry will have a substantial negative impact on the local and state economies. Development and operation of the proposed Montanore mine will partially offset these negative economic impacts and improve economic diversification. (71, 90, 93, 234)

Response: *Cumulative Impacts* in the *Socioeconomics* section discusses the relationship of Montanore Project development to other parts of the economy such as the wood products and mining industries. It has been revised to reflect recent data from the U.S. Census and other indicators of decline in the timber industry. Structural changes in the regional economy (e.g., the timber industry decline) cause pressure on existing social and economic systems and structures as dislocated workers seek new local jobs or leave the area. Montanore Project development may offset some of the employment , population and social changes resulting from the timber industry decline in Lincoln County.

19SE Noranda, when producing, will pay huge taxes and that will cut the tax rate we pay to District 4. Their taxes will go directly to Libby while FS stumpage school share goes to Helena School Foundation. (9)

The project would help the local businesses as well as the tax base to help fund schools and municipal projects. Would take up some slack in our shrinking wood products industry and help in the loss of our vermiculite mine and mill. Can remember when Rainey Creek was a filthy mess all year around, the state stepped in and made them clean it up. Good things happen in both directions.

In regard to the second form of economic benefit enjoyed by Lincoln County, property tax receipts will be much higher than otherwise predicted. This is a particularly important issue for public service planners; if the timber harvest is constrained, large drops can be expected in state and local timber receipts. With the Montanore Project, large increases in taxable valuation are expected, and, with this, rises in tax receipts. (259)

Response: Property tax payments by Noranda in association with Montanore Project development are discussed in the *Socioeconomics* section of Chapter 4 and in the Hard Rock Impact Plan. Tax revenues for a mining project and for Forest Service stumpage are dependent upon Federal, State and local laws and regulations.

Project Viability and Economics

20SE Might it be possible that the subject ore body is not economic at current commodity price levels and that development might be postponed until higher metals prices are realized? (51)

Desires Noranda to cut in half its proposed ton's per day rate of extraction and milling with a double benefit, half the impact on the environment and twice the proposed life of the mine and associated jobs. (12)

Response: The viability of the project is determined by a number of factors including the optimum mining and processing rates. Requiring Noranda to reduce its production rate could significantly affect project viability. Reducing production rates probably would increase production costs and could make the mine uneconomic to operate, or result in shutdowns during cycles of low metals prices.

Reducing the production rate would not result in significantly less environmental effects. The overall surface disturbance would be the same. Further, many environmental impacts, such as effects on wildlife and recreation, are related directly to the duration of operations. These impacts could be reduce by increasing the rate of production, and mining the deposit in a shorter time period, as opposed to a lower rate for a longer period.

21SE Noranda Corporation has only one goal in building a mine under the Cabinet Wilderness Area and that is to make a profit. No one should be deceived to think that Noranda cares anything for Libby or for Montana, or for that matter the environment. Their agenda is to make a profit and that's all! For example, if for any reason the economy changes unfavorably or the price of precious metals falls, Noranda will promptly and unceremoniously close the mine and will walk away and where will that leave the employees and the Libby economy? (163, 147)

Response: The profitability of a project is not normally an issue within the scope of an EIS. Noranda's right to mine the ore body is dependent upon State and Federal laws and regulations. The agencies would take several steps to ensure compliance with environmental regulations as discussed in the FEIS. A reclamation bond would be posted by Noranda to ensure adequate funds for reclamation. The effects of project shutdown are discussed in the *Socioeconomic* section of Chapter 4. Provisions of the Hard Rock Impact Act (as amended by SB 410 in 1989) require establishment of a Hard Rock Mining Impact Trust Account to mitigate the effects of mine closure or a major workforce reduction.

22SE Some estimate of gross values of the ore reserve at current market prices would give the reader some scale of this economic development from which to base further comments. (117, 118)

Response: Reserve estimates and average metal concentrations are presented in Chapter 2. The gross value of the deposit has limited meaning, since it does not reflect the capital and operating costs to extract and process the ore. The overall worth or the profitability associated with the ore reserve is not within the scope of the EIS.

23SE Also the ore deposit is large enough to last many years past that sixteen years. (9)

The FEIS should disclose a realistic projected disturbance time period based on anticipated mineral deposits which have not yet been fully delineated. (247)

What provisions are made for expansion and the problems that go along with that; if production is increased due to demand or if more ore is discovered? (245)

Response: Noranda is still acquiring data describing the extent of the ore body. The proposed action calls for a mining operation lasting an estimated 16 years.

Community and Fiscal Effects

24SE A Community Interest board consisting of Lincoln County Commissioners, Chamber of Commerce and other special interests needs to be established. (92)

Noranda's willingness to work openly with a citizens advisory group would be a very positive "good faith" gesture. (115)

Response: The agencies are not sure what the reader intends with the comment regarding the Community Interest board. The Hard Rock Impact Plan describes the intent to form a Montanore Impact Oversight Committee comprised of 5 members representing Lincoln County, the municipality of Libby; the Libby School District; the Troy area; and Noranda Minerals Corporation. There are already several other boards or committees in the area evaluating economic development issues.

25SE Has consideration been given to emergency medical response by air and ground to mine area in event of many injured employees? (18)

Response: In the Hard Rock Impact Plan, Noranda has included a discussion of emergency and first aid care in its proposed plan of action. This policy would require Noranda to establish an on-site first aid station. EMTs would be on staff during all shifts to respond to mine-related emergency situations. A non-licensed ambulance would be available on site to transport injured persons to the hospital in Libby.

26SE Need opportunities for adult training and education, i.e., through FVCC. Notes from public meeting 22)

Response: Development of the Montanore Project could increase the demand for adult training and education, both directly and indirectly. From a direct perspective, Noranda has indicated in its response letter to the DEIS that it would institute training programs for most positions (see Alternative 1, Chapter 2). Any institutions such as FVCC which desire to be involved in this effort should contact Noranda to discuss this possibility.

27SE Are any of the taxes or profits going to be spent on assisting the social services provided to the poor, elderly and handicapped of Lincoln County? (138)

The HHS has increased its case load by 100% in just the last year. (256)

Response: As noted in the *Socioeconomic* section of Chapter 4, funding for social welfare services comes from state, federal, and county sources; the state administers the welfare program. Two specific budget items included in the Lincoln County budget are Senior Citizens and Senior Citizens' Transportation. Based on current information, property tax revenues will accrue to both of these budget accounts from Montanore Project development.

Additional funds from State and Federal sources may also accrue to Lincoln County social service efforts, but in a more indirect way compared to direct property tax revenues specifically paid by Noranda. There is no indication Noranda would spend any profits (defined in the traditional accounting sense) on social service needs. However, Noranda has committed in its Hard Rock Impact Plan to work with local governments to mitigate any currently unforeseen impacts due to Montanore Project development.

28SE Even though people would leave the community, many are either retired or emotionally committed to staying in the area. Hence, decline in the demand for public services will not necessarily correspond with the anticipated declines in timber related revenues. (259)

Response: A decrease in economic activity (e.g., as measured by employment) does not necessarily lead to a direct decrease in demand for public services. However, if employment decreases lead to population decreases, demand for public services probably would also be reduced.

29SE The impact upon the state, county and city economies because of shutting down the Libby Creek adit should be included in the environmental evaluation. (222)

Response: The cessation of the Libby Creek adit construction is outside the scope of the EIS. The proposed action covered by the EIS is the construction and operation of the Montanore

Project. As discussed in Chapter 2, permitting of the Libby Creek adit was handled by the DSL in a separate action.

30SE In addition, a minimum of 20% of the taxable valuation of the gross proceeds of a hard-rock mine must be reserved to the local government unit in which the ore body is located, so some funds will flow directly to the local governments. (259)

Response: *Fiscal Impacts* in the *Socioeconomics* section of Chapter 4 has been revised to reflect the requirement of reserving 20 percent of the gross proceeds useable valuation of a hard-rock mine for the local government unit in which the ore body is located.

Worker Health and Safety

31SE Someone has to worry about the miners. They will have to burrow 3.4 miles underground to get to the ore body. Will the "wet scrubber system" in the primary crusher underground protect the miners from dust? Will the wet scrubber control the dust? (31)

I was disappointed that worker health and safety concerns were not addressed. (158)

EIS needs to address worker safety and health as requirements of the permit. Unless certain standards are met, the permit should not be granted. (126, 147, 153, 251)

Why is MSHA, a federal agency not a party to the preparation of this EIS ? (147)

Response: Underground air quality and other health and safety issues of mine workers are the responsibility of the Mine Safety and Health Administration. This issue is beyond the scope of the agencies' analysis, and is therefore not discussed within the FEIS. Noranda would be required by MSHA to meet its regulatory requirements designed to protect worker health and safety during mine construction and operation.

32SE Concerned for the poor in Lincoln County who do not want to leave and who do want to work. (73)

Response: The project would affect different people in different ways. Social services programs are designed to help people in need. This resource would be available to those who seek it.

33SE As for air at the mining site, state regulations must be adhered to and the use of electric machinery inside the mine should minimize the pollution problems there. (83, 110)

Response: Regulations enforced by the federal Mine Safety and Health Administration would apply to the Montanore Project. Using electrical machinery would minimize emissions.

34SE What will Montana do for the miners affected by silicosis? Where is OSHA? What do they say? (213)

Response: Underground air quality is the responsibility of the Mine Safety and Health Administration. It is outside the scope of this EIS.

Miscellaneous

35SE Estimated capacity for Libby Middle School should be 650 not 900. Estimated capacity for Libby High School should be 700 not 1,000. (8, 153)

Response: The table has been revised to reflect your comment.

36SE Neither of the two comments made by the Superintendent's secretary are correct. Should read, needs additional staff and Elementary school facilities (K-5) close to capacity. (8, 153)

Response: The table has been revised to reflect your comment.

37SE Concerning Issue 4 - It is noted that Noranda would pay for all increased costs to local government units resulting from the project. We do feel that this issue statement should also relate the intent to mitigate impact on the public school systems and services to a level acceptable to school administrators. (92, 136)

Response: The text has been revised to reflect your comment.

38SE Noranda will increase the educational, social, business and medical opportunities, to mention a few, through their payroll and tax payments. (134)

Response: The opportunity for positive effects from the Montanore payroll are noted in the *Socioeconomics* section of Chapter 4. Benefits from tax payments would largely depend upon the scope and terms of the Hard Rock Impact Plan negotiated between Noranda and affected local government units.

39SE Although you did not address this issue in this SDEIS we feel that it is important and should be discussed. We are currently feeling the effects of the Forest Service's shift from resource extractive activities to more recreational activities. This shift has devastated that Libby area, we feel the USFS has some obligation to this area and the surrounding communities. We request that the social and economic impacts be given the same consideration that you give other issues in this document. (223)

Response: The purposes of the Supplement DEIS was to present additional information and analysis on the proposed action and alternatives in certain resource areas. These areas did not include socioeconomics; consequently, socioeconomics was not discussed in the Supplemental DEIS. Socioeconomics is identified as a significant issue in the FEIS. Project socioeconomic effects are presented in the *Socioeconomics* section of Chapter 4.

40SE Tourism will be negative, while the need for silver and copper hasn't increased for years. (168)

Response: The effects on tourism will vary, depending upon people's values and other tourism alternatives available to these people. The marketability of silver and copper is not an issue within the scope of this EIS.

41SE Asked that socioeconomics issues be addressed by studying what the affects of the ASARCO-Troy project have actually been. There is virtually no discussion of unemployment as a problem connected with the closing of the mine. (137)

Response: All available information has been utilized in preparing the socioeconomic analysis. Noranda has committed to a socioeconomic impact monitoring effort associated with Montanore development, due primarily to requirements in the Montana Hard Rock Mining Impact Act of 1981. This data should provide a very useful analysis of mining impacts in Lincoln County. Since Troy was developed prior to implementation of this Act, data on Troy impacts is not available from such a monitoring effort. The section entitled *Temporary or Permanent Closure* discusses that the mine is scheduled to close in approximately 2010. When the mine is closed, the local area economy would lose 450 jobs. Depending on other job opportunities, some or all of these persons would become unemployed.

42SE I strongly object and take exception to this statement on page 272 [of the DEIS]: that negative comments on the mine development are from people who are less dependent on the local economy and do not have an interest in community growth, etc. Insist that this text be reworded or removed from the final EIS ! (163)

Response: The section on *Social Well-Being and Quality of Life* in the *Socioeconomics* section of Chapter 4 has been revised.

TRANSPORTATION

1TR The section of the road proposed for closure (Ramsey to exploration adit) is described as open to public use (in the EIS) while the mine is in operation. Will it be open or closed for recreation? (24)

Response: Road 6210 would be used by Noranda during the construction phase to haul waste rock from the Libby Creek adit to the tailings impoundment. Using this road instead of the Libby Creek Road would avoid mixing mine traffic with recreational traffic on the Libby Creek Road and eliminate the need for substantial reconstruction of the Libby Creek Road. Noranda's proposal is discussed in Chapter 2. The road would then be closed to motorized traffic.

2TR Why would the Libby Creek Road 231 be plowed during the winter. Surely the all-weather road up Bear Creek will provide the necessary access to the proposed facilities. Plowing the Libby Creek road will only increase impacts on the area and should not be permitted. (51)

The Bear Creek road will be widened and improved. The Libby Creek road will not routinely be used for mine access. The Libby Creek road will not be plowed during the winter. (139)

Please take a good look at this. Make them fix Libby Creek Rd. (78)

Response: Libby Creek Road would be used only during the construction phase (widening of the Bear Creek Road). It would not be plowed during the winter during operations.

3TR Can see keeping the public out of the immediate mine area for safety reasons but why lock up the adjacent areas in a wilderness which was set aside for public use in the first place. Due to the rugged terrain in the Cabinets, there are only limited areas where a hiker can gain access to many of the lakes and scenic ridge tops. Hopes this access is not severely limited due to road closures. (119)

Response: Noranda would restrict access to the Cabinet Mountains Wilderness above the plant site in Ramsey Creek. Other existing access would not be affected by the project.

4TR It appears as though all concentrate will be shipped to the railway via the Champion Haul Road beginning where USFS 278 junctions with U.S. 2. If this is correct, it is detailed in only a couple sentences that I can find in the document. The Champion Haul Road is in very poor condition and would require much construction to bring it up to a useable standard. People living along the haul road will be interested in knowing what construction and traffic may be occurring along it in the future. Why wouldn't Noranda use U.S. 2? This is not detailed in the DEIS. (117)

Response: Noranda's proposed use of the Champion haul road is discussed in Chapter 2. The road would need resurfacing prior to use. Noranda chose to propose using the Champion road rather than U.S 2. Safety and traffic flow would be primary concerns with U.S. 2.

5TR Will the loading site at Libby be monitored? How? Safeguards outlined in the DEIS are inadequate. (121)

Where do the concentrates go from Libby? (121)

What kind of rail care will be used? 121)

Where will the concentrated ore go to be smelted? Will it go by freight or truck and over which routes? (31)

Response: Present plans are for the concentrate to go by rail to Canada for smelting. No monitoring is proposed at the site. Noranda has a spill prevention plan to address spills and accidents. Given the value of the concentrate, Noranda would promptly cleanup following any concentrate accidents, should they occur.

6TR The construction of significant amounts of road, including the widening and reconstruction of existing roads, is incongruous with the existing aesthetic qualities of the Cabinet Mountains Wilderness and surrounding areas. Increased traffic associated with the mining operation during construction and operation phases would significantly degrade the recreation atmosphere which now exists adjacent to the wilderness area. With roads constantly intruding into roadless lands due to pressures to meet unrealistic timber sale quotas, increased pressures on an area currently managed for non-motorized recreation is totally unacceptable. (86)

Response: The anticipated effects to recreational opportunity and use and to the character of roadless areas are described in the *Recreation* section of Chapter 4.

7TR Homeowners on the old Priester ranch are concerned with the upgrading of the Bear Creek Road. They feel that the road only needs to be widened, but some thought should be given to blind corners and accesses. They would like to be included in plans for improvement on the first three miles, especially that section that crosses their ranch. (27, 117)

What traffic control measures does Noranda propose to minimize the probability of concentrates truck accidents? (121)

What precautions will be taken to protect the creek at the road crossing? Traffic there will be heavy. (121)

What mitigation and clean-up process is planned by Noranda, if a concentrates truck accidents? (121)

Response: Present traffic levels on the Bear Creek Road is between 50 and 100 vehicles per day, about half of which is estimated to be associated with logging activities. Bear Creek Road would be widened to accommodate increased traffic levels. The agencies welcome any specific comments on road improvements. Noranda has a spill prevention plan to address spills and accidents. Given the value of the concentration, Noranda would promptly cleanup following any concentrate truck accidents.

8TR The proposed mitigation to return the Bear Creek road to the pre-mining width is not justified in the DEIS. Maintenance costs could be reduced by maintaining a reduced width, but the disturbance and cost to physically reduce the road width do not appear to be justified. (139)

Response: Alternatives 2 and 3 include returning the Bear Creek Road to the pre-mining width, unless the KNF would want a wider road.

9TR The 500% increase in traffic is intolerable. A responsible company would slowly increase traffic on the Bear Creek Road, instead of invading. (200)

Response: The requirement for Noranda to develop a transportation plan described as part of Alternatives 2 and 3 responds to the issue of increased traffic. A 500% increase in traffic would occur under Alternative 1.

MISCELLANEOUS COMMENTS ON DEISs

Alternatives

1MI Have problems with this document understanding the "alternative scheme." The alternatives are not mutually exclusive as is typical in an EIS. Support habitat compensation, education, and law enforcement from 2, wetlands water treatment in 3, and powerline placement in 6 with helicopter stringing of lines. Support road closures that would bring USFS management promptly in line with the Forest Plan. Support metal concentration monitoring in fish populations. (117)

Response: All the modifications, mitigations, and monitoring proposed in Alternative 2 would be the same for Alternative 3, which has the addition of modified water management and treatment. A system designed to reduce tailings seepage would not be included in Alternative 3A. Alternatives 4, 5 and 6 are alternate transmission lines.

2MI Assume that Alt 1 is the proposed action and the alternative that is preferred by Noranda. It appears, however, in Chapter 5, that there have been some requirements included that were not made by Noranda and that, by choice, would not be acceptable to them. (112)

The range of alternatives considered in the EIS is inadequate because it fails to consider significant variation over five of the six issues: Wildlife, recreation, wilderness, socioeconomics, and tailings disposal. (128)

Response: Alternative 1 is Noranda's proposal. Alternatives 2 through 6 include modifications or mitigations designed to minimize or reduce adverse environmental impact. These alternatives were developed in response to the significant issues developed during scoping. The *Development of Alternatives* discusses project alternatives in greater detail.

3MI Propose that two additional alternatives be analyzed in order to explore a range of potential impacts to the five issues listed in EIS as well as the sixth-water quality. These two alternatives would permit an operation based on 5-10,000 tons of ore processed per day. One alternative would involve scaling down the facilities to achieve the lower production level; the other would involve operating the planned facilities for only 8-10 hours per day. Both alternatives are clearly feasible from a technical standpoint. Both provide the opportunity to consider a range of impacts to all six issue areas. (128, 130)

Response: The viability of a project is determined by a number of factors including the optimum mining and processing rates. Requiring the company to reduce its production rate or operate only one shift per day could significantly affect project viability. Reducing production rates would likely increase production costs and could make the mine uneconomic to operate, or result in shutdowns during cycles of low metals prices.

It is unlikely that cutting the production rate would significantly reduce environmental impacts. The overall surface disturbance would be the same regardless of production rate. Arguably, many of the environmental impacts could be reduced by increasing the rate of production and mining out the deposit in a shorter time period, as opposed to mining at a lower rate for a longer time period.

4MI Consider a broader range of alternatives, including combining the Montanore Project with the Rock Creek Project and a scaled-down operation. (239, 256)

The combined impacts of Noranda, Rock Creek and possibly other mines must be considered. (245)

Response: The agencies have considered a broad range of alternatives in response to the identified significant issues. Development of alternatives are discussed in Chapter 2—*Development of Alternatives*. Combining the Montanore Project with the Rock Creek Project is discussed in Chapter 2—*Alternatives Considered but Dismissed from this EIS*. Alternative 3 was developed in response to concerns about water quality. The FEIS includes an expanded discussion of treatment alternatives and combinations of water treatment.

5MI Alternative use of USFS road 231 as the main access road to the mine was not evaluated. Would rather see one road designated and used by the company. Rd 231 is a 3 mile shorter access road than 278 is already experiencing greater traffic flow. Appears that 231 would intersect less grizzly bear habitat and less big game range. Why was this alternative not displayed and evaluated? (117

Response: Use of the Libby Creek Road was considered under *Alternatives Considered but Dismissed from this EIS* section of Chapter 2. Libby Creek Road was not selected because it has steeper slopes and more stream crossings, would require more extensive construction, would require the use of U.S. 2. and is a primary travel route to Howard Lake.

EIS Process/NEPA & MEPA Compliance

6MI A new DEIS should be written. Too many deficiencies and too much inaccurate or unsubstantiated information in the current DEIS for it to clearly represent the impacts of Noranda's proposal or of the agencies' alternatives. Much information is not available for public review, many cases conditions are speculated on without follow through as to what resultant scenario could occur. a proper representation of the impacts would significantly alter this document enough to call for the agencies to start again. (126, 85, 102)

Response: The agencies issued a Supplemental DEIS in response to public comments on the DEIS. Noranda's permit application is on file with the agencies and public libraries in the area. The KNF maintains a complete project record.

7MI Some aspects of the proposal are not fully described. Specific mitigation measures which will be implemented and included as stipulations to any approved permit, should be presented and analyzed in a supplemental DEIS or the final environmental impact statement, and included as appendices to the EIS, as appropriate. (171)

Response: A Supplemental Draft EIS was issued by the agencies for public review and comment. The specific mitigation measures which would be implemented and included as stipulations to any approved permit are described under the Alternatives in Chapter 2.

8MI The environmental impacts of the proposal, especially those concerning wetlands and endangered species, are not adequately described. Therefore, we recommend that the FEIS not be released until after biological assessment, the U.S. Fish and Wildlife Service's biological opinion, and the section 404 permit application have been prepared. Information in these documents relating to impacts to/mitigation for fish, wildlife and wetlands should be included in a supplemental DEIS or the FEIS (with appropriate time allowed for public comment). (171)

The SDEIS has the same deficiencies as the DEIS. Thus another SDEIS or the FEIS should include information from the Forest Service's biological assessment, the Fish and Wildlife Service's (FWS) biological opinion, and the 404 permit application and final wetland mitigation plan. Without these pieces of information, a complete description of anticipated impacts and identification of appropriate mitigation is not possible and does not allow for a comprehensive review of and comment on the entire proposed action. (247)

Response: Noranda has submitted additional wetlands information to the U.S. Army Corps of Engineers as part of the Corps' review of Noranda's 404 permit application. Additional information on wetlands is presented in the FEIS. The *Biological Assessment* is included as Appendix C. Consultation with the U.S. Fish and Wildlife Service concerning the grizzly bear will be completed prior to the KNF's issuance of the Record of Decision.

9MI Some impacts are omitted altogether. For example, to mitigate for impacts to grizzly bears, applicant would support changes to hunting licenses. The impacts on hunters that these actions would bring are not described. In addition, most of Chapter 4 is written with the verbs "could," "may," "should," and "might." Little is presented to indicate the probability of an impact occurring. The EIS should clearly present the impacts that are expected. (171)

Response: Most of Chapter 4 is written using the verb "would" because the impacts *would* occur if the project is approved. Noranda's proposed mitigation plan and the agencies' mitigation plan is described in Chapter 2. The anticipated impacts to grizzly bears is discussed under *Grizzly bears* in the *Wildlife* section of Chapter 4.

10MI Pg. 187 [of the DEIS], states: Because "proposing" to intercept carries no obligation to do so, we recommend that "proposing" be changed to "commits" or "will be required to." (171)

Response: Noranda's entire application is a proposal to develop an underground mine and mill project. All "proposals" contained and described in Noranda's mine and transmission line permit applications become binding as part of permit issuance.

11MI The FEIS should indicate that a single FEIS will be prepared by the Agencies for the Montanore Project. (139)

Response: Chapter 1 has been revised to indicate that a single FEIS has been prepared by the agencies for the Montanore Project.

12MI Noranda believes that the selection of the appropriate decision making sequence option is not necessarily a matter for public comment. (139)

Response: Chapter 1 on agency decisions has been revised to reflect proposed decision sequencing.

13MI Decision Document: Chapter 1 of the DEIS describes how the EIS process supports the Agencies' decision making. Noranda recommends that the FEIS clearly state that it is not a decision document per se. The following language from the U.S. Forest Services NEPA Guidance Manual should be added to the purpose and need section of Chapter 1: environmental impact statement is not a decision document. It is a document disclosing the environmental consequences of implementing the proposed action and alternatives to that action.

The decision will be documented in a record of decision signed by the responsible official. NEPA Procedures Handbook Chapter 40 Environmental Impact Statements and other documents. Section 42.2 content, FSH1/86-R-2 Supp. No. 2. (139)

Response: Chapter 1 adequately describes the EIS and permitting process for the Montanore Project.

14MI Noranda recommends that the FEIS clearly state that the agencies performed a connected actions analysis and determined that no connected actions exist for the Montanore Project. (139)

Response: A discussion on connected actions has been added to Chapter 2 under *Reasonably Foreseeable Activities.*

15MI Noranda recommends that the final EIS specifically identify those resources, if any, which will be irreversibly and irretrievably committed if the Montanore Project is implemented. (139)

Response: Irreversible and irretrievable commitments of resources are described under each resource in Chapter 4.

16MI We need to question the approval of any proposal that created jobs and generates money. Can we afford it? Both MEPA and NEPA require "a detailed statement" on "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity." I find no such statement in the EIS. (137)

Response: Chapter 4 has been revised to include a discussion of the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity.

17MI 40 C.F.R. 1502.24 requires the disclosure of methodologies used shall make explicit reference by footnote to the scientific and other sources relied upon for statement. An agency may place discussion of methodology in an appendix. (108, 118)

Response: Chapter 6 summarizes the baseline data collection and impact assessment methods. References to literature occur throughout Chapter 4.

18MI 40 C.F.R. 1508.7 and 1508.8 of the National environmental Policy Act require assessment of cumulative impacts and effects (Direct effects and Indirect effects). (108, 85)

Response: The direct, indirect, and cumulative effects on each environmental resource is discussed in Chapter 4.

19MI We believe that the DEIS is over stepping it's bounds when requesting that no other activity be conducted in the vicinity of the project. This is in violation of NEPA and does not follow forest plans. (110, 122)

Response: The DEIS and the FEIS discuss the reasonably foreseeable activities in Chapter 2. These activities include timber sales, mineral activities, ASARCO's proposed Rock Creek Project and other activities. The EIS is not a decision document and does not request that other activities not be conducted. It does recognize, however, that effects to grizzly bears may limit the amount of future activities in the project area.

20MI The DEIS is an inadequate document. Fails to provide enough information to enable us to come to an informed decision regarding Alternatives 1 through 6. Areas of concern to us, such as acidification potential, acid precipitation effects, impact on the Kootenai River, concentrates transport. DEIS either ignores the issue or suggests that we can wait until the mine is operational and then find out what will happen. We do not believe this is appropriate, given the magnitude of the project. (121, 130)

Response: The agencies' analysis associated with these issues is discussed in a revised *Surface Water Quality* section of Chapter 4.

21MI The EIS process and the number of issues involved with this project have gone too far; beyond what is in adherence to environmental laws. (260)

Response: The analysis documented in the EIS is required by the National Environmental Policy Act and the Montana Environmental Policy Act. A number of significant issues are involved in the permitting and EIS process. Table 1-1 provides a list of major permits and approvals which would be required by Noranda.

22MI He does not believe his comments have ever been incorporated into a single one of the various proposals. He questions why comments are even solicited from the public! The whole NEPA process is a farce and we are wasting our time communicating our concerns. (256)

Response: As discussed in the introduction to these comments/responses, all comments are reviewed carefully. Public comments on the agencies' analysis in the DEIS and the SDEIS have resulted in substantial changes throughout the final EIS.

23MI Meetings in other locations in addition to Libby should be held; suggests Missoula, Great Falls, Denver, and Washington DC. The issues were broader than just the local area, i.e., Grizzly Bears and Wilderness. Believes the public meeting was too soon and too short of notice. (4)

Response: Persons unable to attend the public meetings on the DEIS and the Supplemental DEIS had the opportunity to submit written comments.

24MI There is no discussion about what those hard rock permit requirements might or could be that the public wisdom could in detailed study deduce their adequacy or lack of and propose alternatives. (147)

Response: The permit requirements are described in Noranda's permit applications and any modifications described in the agencies preferred alternative.

25MI Copper and silver are both "hard currency" commodities. Production of these commodities, like timber and agricultural commodities is the basic national source of our money supply. Should not the EIS address the current world sources of these commodities and a brief discussion of trade deficits and our dependency on other countries for our basic needs? (233)

Response: Discussion of the current world sources of copper and silver and trade deficits are outside the scope of the EIS. The purpose of the EIS is to document the possible environmental effects of the Montanore Project or reasonable alternatives.

Other Comments

26MI Wonder if Noranda can really move 20,000 tons per day through a single adit, and if they can't, will they seek to amend their permit to, for example, mine through the Libby Creek adit? (128)

Response: The agencies have evaluated Noranda's proposal to move 20,000 tons per day through the twin Ramsey Creek adits and have concluded it is reasonable.

27MI Pg. 135 [of the DEIS]: Please remove paragraph 4, because of the impacts of the Montanore Project already experienced, it is not feasible for the permit holder to continue to use this allotment. (127)

Response: The text in Chapter 3 has been revised to reflect the present status of the Libby Creek allotment.

28MI The FEIS should indicate that a qualified, experienced professional will be required for review of the mine plan. (258)

Response: Noranda's mine plan and tailings impoundment design have been reviewed by professional engineers. Under Alternatives 2 and 3, a mine engineer would review Noranda's information collected following completion of the Libby Creek adit. The engineer would be qualified to complete such a review.

29MI Engineering input rendered by the agencies or other interested parties during operation should be provided by a registered engineer. Montana law required that the engineering aspects of an EIS be prepared by registered professional engineer and that this work be identified by signature and seal. This requirement is not evident in the DEIS or the SDEIS. The draft EIS and the subsequent supplement to the draft EIS has references in several areas to specific engineering concepts and parameters. Many of these statements may be inappropriate without further qualification. (194)

Response: The agencies' consultant did provide review by professional engineers of various portions of Noranda's proposal, such as the tailings impoundment design, and the mine plan design, to evaluate impacts. In addition, the agencies and their consultants developed conceptual designs for gravel drains and provided possible water treatment methods. If Alternative 2 or 3 is selected, Noranda would be responsible for selecting a method of reducing tailings seepage and/or a water treatment method. The qualifications of the individuals involved in the EIS preparation are presented in Chapter 7.

Clarifications

30MI Why does the DEIS not include a topographical map of the impoundment area and surface workings area, printed in a scale large enough to be read? We need one, with the proposed disturbances accurately drawn in. (121)

Response: Topographic lines have been added to Figure 2-11. Larger scale maps showing all proposed surface disturbances are included in the permit applications on file with the agencies and at area public libraries. Libraries are listed on page S-1.

31MI The drafting [of Figure 3-2 in the DEIS] is misleading, indicating in the cross section that the ore body continues on the eastern side of the axis of the syncline. The nature of the potential ore body on the eastern side of the syncline is unknown. (139)

Response: Figure 3-2 has been revised.

32MI On page 20 [of the DEIS] check "4.15 million tons of waste rock." Should it be 415? (no decimal point) (31)

Response: 4.15 million tons is correct.

33MI Would like to see the room and pillar mine superimposed on the topography, and on a small scale so they can assess the damage. (31)

Response: Detailed maps of the mine area are on file with the agencies.

34MI Minor typo errors on following pages: 63, 152, 227, 246, 272, 275, 276 (34)

The source document for Figure 2-11 (R) should be dated 1990a rather 1991a. In addition, references to Morrison - Knudsen Engineering should be Morrison-Knudsen Engineers. (258)

Response: The text has been revised to correct these typos.

35MI What is the difference between the permit area and the disturbed area? Could the company disturb all area within the permit area? What are the companies rights within the permit area? (117, 102)

Response: The permit area must enclose all the disturbances associated with the mining development. It also defines the boundary beyond which ground water quality degradation (the "mixing zone") cannot occur without an authorization allowing a change in ambient water quality from the Montana Board of Health and Environmental Sciences. This artificial mixing zone ceases at the end of mining and bond release at which time the ground water quality standard would apply at the point of discharge.

The disturbance area contains the bonded disturbances within the permit boundary. The disturbance area or the permit area cannot be increased without applying for an amendment to the operating permit.

36MI It is not apparent that any of the mine development openings will cross the Snowshoe fault. (258)

Response: The text in the *Ground Water Hydrology* section has been revised to indicate that the mine development openings would not cross the Snowshoe fault.

37MI Alternative 3 claims to eliminate 80 acres of percolation pond area. This is not correct as that area, even with water treatment, may be required for land application. (258)

Response: The table indicates that the 80 acres of disturbance associated with the percolation pond areas *may* not be required.

38MI Every effort must be made to control spotted knapweed on your roads, cuts and activity areas. Strongly recommend that you keep weed control a high priority plan. (45)

Response: The agencies agree with this comment. The *Soils, Vegetation, and Reclamation* section discusses the importance of spotted knapweed control.

TRANSMISSION LINE

Alternatives

1TL Opposed to alternative 6. Will fight alternative 6 going over private buildings and training facility for purebred Arabian horses. Further letters and petitions to Not Accept Alt. 6 will be forwarded within the 60 day DEIS time period. Absolutely will not accept the decision to put the powerline over their land. (6, 110)

Alternative 6 is clearly the most desirable. This alternative involves less overall erosional impact, fewer roads. significantly less wildlife impact and less scenic impact. If the Montanore Project proceeds, Alternative 6 (incorporating all the changes described in Alternative 4) must be the Alternative selected. (51)

Transmission line is a necessary part of the project. I would not be opposed to the power line. (57)

If the transmission line will offend some that go to Howard lake the solution would be to follow Alt. 4 or 5 and run the line along the back side of the ridge. (57)

Response: Decisions regarding siting of the transmission line will be made by the Board of Natural Resources and Conservation (Board) through a contested case proceeding to be conducted following the EIS process and through a record of decision issued by the KNF. Chapter 1 discusses the hearings process of the Board. Under Montana law, a person waives rights to appeal Board decisions on the project if they fail to participate as active parties in the contested case hearing (75-20-221 MCA).

2TL Alternative 6 involves the least overall impact to the environment and particularly to wildlife. The agencies do not adequately explain the reasons for their change from this Alternative to Alternative 5. Alternative 6 should be re-adopted. (203)

It seems that the view of the transmission line won't be that much above the tree line and can be established without any permanent wildlife habitat disruption. (224, 260)

It is not clear from the SDEIS why the Agencies changed the recommended power line route from the Swamp Creek Alternative (Alternative 6) to the North Miller Creek Alternative (Alternative 5). What is the actual basis for the change in the Agencies' recommendation? (201)

3TL With the exception of slightly more total acres of clearing required, Alternative 6 appears to involve the least overall impact. The alternative requires less impact on wildlife, particularly on winter game habitat in the Miller Creek drainage and on the grizzly bear, requires less new road building, crosses fewer streams and impacts fewer miles of elk security habitat. It would also have less scenic impact. (201)

Response: An objective reading of the DEIS and the supplemental DEIS provides an adequate explanation of the impacts and tradeoffs involved in recommendation of a combined route and centerline for the proposed transmission line. The differences in impacts between Alternatives 5 and 6 are not significant, and the choice of a recommended option involves some subjective weighting of impacts, mitigation, and requirements of MFSA in light of the Board-preferred route criteria. It is the agencies' view that Alternative 5 provides the best balance, considering all factors for both route and centerline-level issues. The reader also is referred to the response to previous comments regarding participation in the Board's decision-making process.

4TL On page 112, the SDEIS refers to a proposed power line tower near the confluence of Howard and Libby Creek. The agencies should note that the confluence of Howard and Libby Creeks is located on private land owned by LPMC. LPMC requests that the proposed power line routing be adjusted to avoid this private property. (204)

Response: The location described is common to Alternatives 4, 5, and 6. The centerline analyzed by the agencies is believed to be on National Forest system land. The tower site in question would be moved to avoid impacts in a location classified as a shrub-dominated wetland area. The objective of the agencies' final tower placement in this area would be to minimize impacts to the wetland area, regardless of the ownership designation.

Power Supplier

5TL The proposed mine is within Flathead Electric's service territory. They were notified that they were the preferred utility to serve the Montanore Project. In response they devoted substantial resources to drafting a proposed service agreement to supply electric service to the mine. In the course of the developing this agreement they took into account the impacts of mine development on the existing electric service members in the area and on future growth in demand due to the mine. The core of the proposal was that Flathead Electric Cooperative would design, build, and own the facilities serving the mine. Noranda, however, has proposed to design, build, and own the facilities itself, and to retain an electric utility to operate and maintain the facilities. We firmly believe this aspect of the proposal would not serve the interests of the public. (82)

Flathead Electric Cooperative has proposed to Noranda that we are willing to plan, design, construct and finance facilities appropriate for serving their proposed mine. We are convinced that proposal is in the best interest of Noranda and the public and that to permit otherwise will result in grave economic consequences for future consumers in our service area. (82)

Our cooperative has the resources to meet our commitments as outlined to Noranda. However, commitments from Noranda are essential to establish planning criteria necessary to address, with confidence, stipulations included writing the DEIS. (82)

Response: The FEIS is intended to show the environmental impacts and economic benefits and costs of constructing the proposed powerline. The agencies see no reason to expect that who builds and owns the line would significantly affect either the environmental impacts or project economics. Noranda has not yet reached an agreement with a power supplier concerning construction and operation of the proposed powerline. The agencies and Noranda decided to conduct the analysis for the EIS as if Noranda would build the line to avoid prejudicing negotiations with potential suppliers. This should not be taken as evidence that Flathead Electric Cooperative building and owning the line has been ruled out.

6TL It must be understood that the Bonneville Power Administration (BPA) itself cannot by law construct or serve the mine directly. The service to all developing industries in the power marketing area of BPA must be by a distribution utility. Operation of the tap point substation will be a joint agreement between the distributing utility and BPA. (82, 101)

There area several references in the Draft EIS which indicate that BPA would construct, operate and perform a part of the project; it must be understood that BPA cannot serve or fund construction of the transmission line or substations. (82)

Response: The DEIS was not as clear as it could have been regarding these points. The BPA is prohibited by law from serving the mine loads directly. Until a power supplier is selected to distribute electricity from the BPA tap point, Noranda would not receive electrical service.

7TL FEC concurs that the area is rich in minerals and other resources that will likely involve other future mining and industrial developments in the project area. (82)

Response: The FEIS analyzes reasonably foreseeable mining and industrial developments as part of the cumulative impact analysis discussed in Chapter 2. It is not possible to evaluate effects of future developments beyond those reasonably foreseeable activities identified in the EIS.

8TL A utility is in the everyday business of building, operating and maintaining transmission and distribution lines and must meet regulatory standards established for the good of all consumers and the general public. (82)

Concern that utilities are required to meet public needs and safety and perform adequate maintenance that is not clearly required of industrial customers desiring to use public right ways for single industry service. For example, the statement in the DEIS that annual operating and maintenance costs would be $1400 to $1600 would indicate that less than minimal right of way and transmission line O&M is planned. Also, proposed methods of winter maintenance are via snowplowing which could more adequately and with less environmental impact, be performed by a utility utilizing oversnow equipment. (82)

Response: If approved, the proposed project would be constructed, operated, and maintained in compliance with the National Electric Safety Code and other impact standards adopted by the Board pursuant to Administrative Rules (36.7.3507 ARM). The data regarding annual operating and maintenance costs were developed from information supplied by BPA and were considered estimates. While Flathead Electric Cooperative may believe these costs would be higher, even a ten-fold increase in operation and maintenance cost estimates would not alter the substantive findings of the department regarding need or the economics of the alternative.

9TL As additional load develops in the Pleasant Valley area, Flathead will require greater capacity for our existing distribution lines. Unless Flathead plans, designs and owns the proposed 230 KV tap, we may be burdened to the extent of $2M for establishing our own facilities to receive power from Bonneville's bulk transmission system. Such an investment could not be borne by the local in-migration development associated with the Montanore Project. Other members of FEC would have to subsidize service to the new load in the Pleasant Valley area. (82)

As the electric power utility which presently serves the area, FEC should be responsible for the planning, design and construction and own the facilities necessary to serve this proposed mine, as well as other needs that may develop within our service area. (82)

Service to these future customers should be planned an controlled by the existing public utility, rather than a single large industrial company. (82)

If Noranda plans and designs the power facilities, there is little chance that the public's interest will be best served. Noranda will control use of facilities which may be detrimental to service for other consumers. (82)

The superficial involvement of a distribution utility after planning and construction would not serve the best interests of the environmental planning, general public or electric consumers throughout the local territory. (82)

The in-migration by 1995 may result in cumulative increase in rural population of 256 people. FEC is confident that some of that influx will result in residential and possibly other service-related facilities in their electric power service area. (82)

If FEC is to own the transmission line facilities, we would plan for service to the industrial development in the immediate area. If approved, it is likely that duplicate facilities would result which is contrary to the public's interest. (82)

Duplicated facilities cost all consumers in the territory and the state, which led to the 1971 Territorial Integrity Act to determine which utility can best serve a territory at least cost to all consumers. (82)

Response: Noranda has not selected a power supplier at this time. If Flathead Electric Cooperative is chosen, the issue of duplicate facilities would be avoided. If Flathead Electric Cooperative is not chosen, Flathead Electric Cooperative would have the opportunity to contract with the parties to jointly construct and operate the tap. If doing so would result in a $2 million saving, the parties should be able to work out an agreement.

The FEIS was prepared by federal and state agencies who have responsibility for issuing various permits and approvals for the Montanore project. The FEIS is an independent evaluation of the proposed project and its alternatives. The DNRC examined the tradeoffs associated with 115-kV and 230-kV voltages for the proposed transmission line. This analysis of line voltages is summarized in the FEIS. The Flathead Electric Cooperative offers no data or other information which would alter the conclusion reached by DNRC in its analysis.

It is not clear from these comments what duplicate facilities FEC considers might be necessary. If the duplicate facilities would include another transmission line falling under the Major Facility Siting Act, the Board would need to consider joint use of the proposed Noranda line as an alternative to the construction of a future line. It is unlikely that a duplicate transmission line could meet the Board's decision criteria unless the party proposing the duplicate line could show that it had made a good faith effort to contract for use of the existing facility and been rejected. See ARM 36.7.3505-3507 for the Board's decision standards.

10TL Noranda will have to select a power supplier before the BPA can complete design of the tap station, but not necessarily before they can issue a Record of Decision. (258)

Response: BPA's response to this comment follows: "BPA needs an agreed-upon plan of service with a power supplier prior to design and construction of the substation in order to meet the needs of BPA and the supplier. In the event such needs are not within the bounds of the EIS and for contractual, legal, and business reasons, BPA believes it would be prudent to wait until a power supplier is named and a plan of service mutually agreed to prior to issuing a Record of Decision."

Effects to Real Estate Values

11TL Commenter is concerned with Alternative 6 and Swamp Creek route and how it might affect his property but, more importantly, property values. (6, 29)

Private property would lose considerably real estate value. (6, 110)

Large power lines across the Riding "P" Ranch would effect the resale value and sale-ability of the ranch negatively. (6)

Response: There is a wide diversity of opinions concerning the effects of transmission lines on property values. In some circumstances and for some types of property, probably there are small decreases in the market values of land crossed by transmission lines. There also may be additional nonmarket value decreases that are not reflected in market value appraisals. It is almost impossible to predict the property value effects of a transmission line on a specific piece of land.

There is a mixture of research on the long-term effects of transmission lines on property values (Doane, 1977; Mountain West, 1982; and Furby et al., 1988). Doane Agriculture Service, Inc. (1977) examined 35 farmland sales to estimate possible diminished farmland values from transmission lines. The study conclusion was that "we found but very few cases where there was any perceptible or acknowledged loss in value directly attributable to the fact a powerline crossed the property. While some farm owners and operators express strong opposition to powerlines and appear to be sincere in their statements, market evidence strongly suggests there is seldom a perceptible loss in value." They noted that farmland value losses did occur on irrigated land, particularly where pole placement interfered with mechanical irrigation, primarily center pivot systems.

Mountain West Research (1982) conducted a thorough review of 27 empirical land value studies that met minimally acceptable method standards. Of these 27 studies, 12 studies found that transmission lines had no significant effect on land values, 10 studies were inconclusive, and 5 found overall adverse effects.

The most methodically sound study (Colwell and Foley, 1979) indicated a 5 percent decrease in the actual sale price of urban single family houses that were within 50 feet of a transmission line. There was almost no decrease in the value of houses 200 or more feet from a line.

Mountain West concluded "that the adverse effects (on land values) were more likely to occur (1) in higher-income subdivisions, (2) as proximity to the line increase, (3) when lot sizes were small, and (4) immediately after the line was constructed, but tended to diminish over time."

Furby et al. (1988) indicated that while market value is possibly the best estimate of property value and that values can decrease due to transmission lines, many properties have special values to their owners above and beyond what others would pay for the property. These values include environmental amenities (such as views), personal associations (such as family memories), social ties, or the maintenance of desired lifestyles. These nonmarket values are found in agricultural as well as residential property. Because formal markets for these values do not exist, fair market value does not represent a fair value of well being for these individuals. Several economic studies have found that the compensation demanded to accept a loss in individual well being (i.e. the imposition of a transmission line) is two to five times the diminished value that a new person would identify in their willingness to pay for the property (Furby et al., 1988; Knetsch, 1990; Gregory, 1986; Knetsch and Sinden, 1984; Cummings, Brookshire and Schultz, 1986). This endowment effect (Thaler, 1980, 1983; Tversky and Kahneman, 1986) leads to demanding much more money to give something up than one would be willing to pay to acquire it in the first place.

Noise, and Electrical Fields

12TL Research strongly supports the thought that the magnetic field reduces fertility in mammals, ie, horses and cattle. (6, 29)

Response: DNRC is not aware of research that establishes adverse effects from electric or magnetic fields as suggested in the comment. The body of literature specifically regarding horses is not large, but none of the studies indicates the presence of adverse effects. The following summarizes DNRC's understanding of the body of credible scientific research into this area. "Results from laboratory and field studies with animals demonstrate that some behavioral and, under carefully controlled conditions, some very specific physiological, neurophysiological, and cellular changes can occur. Laboratory studies monitoring livability, illness/malaise, growth, weight loss, persistent stress, birth defects, genetic changes, clinical pathology changes, immunological deficiencies, etc., in exposed and control subjects as well as in a host of in vitro studies do not establish the existence of any adverse health effects of exposure to 60-Hz electric or magnetic fields." (Florida Department of Environmental Regulation, 1985).

Results of utility research and utility operating experience generally indicate that transmission line electromagnetic fields do not adversely affect livestock behavior or health (BPA, 1986). While many studies in the early and mid-1980s were investigating the effects of electric fields, the animals which were the subjects of the studies also were exposed to the magnetic field environments around large transmission lines. A 1980 study found no behavioral or performance impacts to cattle, sheep, hogs, or horses on 11 farms adjacent to a 765-kV transmission line in Indiana (Amstutz and Miller, 1980). Several studies in Sweden focused on livestock fertility. Two studies involved herds of cattle located near a 400-kV line. The first found no effects to fertility (compared to a control group) in 36 herds of artificially inseminated cattle (Hennichs, 1982). The second found that average fertility in cows exposed to the line for more than 15 days per year was not affected (Algers et al., 1981). Finally, Algers and Hultgren (1986) found no effect on fertility in 58 cows placed in pens crossed by a 400-kV transmission line.

Old Growth Effects

13TL The transmission line should not cross any old growth. The fragmentation of old growth areas is a serious problem on the KNF because of past failure of forest management to protect old growth areas. The roading, harvest and further fragmentation of a habitat resource already harvested beyond the Forest Plan limits is unacceptable. All old growth areas should be avoided by any transmission line. Otherwise the Forest plan is being violated. (81)

Response: It is difficult to route a linear facility such as the proposed transmission line to completely avoid a single resource concern such as old growth. Such an approach would likely create other impacts and increase project costs. The agencies conducted an analysis of old-growth effects and determined that the clearing required for the line and access road would affect some old growth along any of the transmission line alternatives. The reader is referenced to Chapters Three and Four for the details on old growth.

Except for Alternative 4, the old growth removed for the transmission line would be in compliance with Forest Plan standards for old growth.

14TL Based on field studies of this route, tree clearing would be required with Alternative 6 including several areas of old-growth forest. (139)

Response: The comment misrepresents information contained in Table 4-27. The table is limited to new disturbance in either elk security range or big game winter range designated by the DFWP and KNF. A comparison of tree clearing along the length of each transmission line alternative indicates some new tree clearing would be required along each of the alternatives. As discussed in more detail in response to the following comment, all alternatives would cross areas containing old-growth forest habitat.

15TL Based on the potential impacts to old growth, it would appear that the Miller Creek Alternative would pose less conflict with the Forest Plan relative to old growth than would the Swamp Creek Alternative. (139)

Response: In response to comments regarding old-growth forest, the agencies evaluated existing resources based on the requirements of the Forest Plan. Chapter 3 presents the status of the existing situation, while Chapter 4 evaluates the effect of the alternatives on the old-growth resource. Based on this analysis, Alternative 6 would affect 74 acres of old growth, and Alternative 4 would affect 61 acres. Alternative 5 would affect an estimated 46 acres of old-growth forest habitat.

Wildlife Effects of Transmission Line

16TL The swampy area that would be involved is also a flyway and resting place for migratory waterfowl. (6)

Response: On October 25, 1990, DNRC personnel met with the landowner in this area to determine the amount of waterfowl use in the area near the Fisher River crossing on the Swamp Creek Route. The information obtained was that 30 to 40 geese use the area for a couple of weeks in the spring and fall. A few ducks also use the area. Construction of the powerline is not expected to have significant effect on waterfowl nesting.

A small percentage of waterfowl using a flight corridor have been shown to collide with powerlines, but given the low level of use, it is unlikely that the transmission line would have significant effects on waterfowl populations on any of the routes.

17TL Has consideration been given to the addition of air craft warning balls on transmission lines over valleys and in known flight paths? (18)

Response: Except for the transmission line crossings of the Fisher River and Highway 2, the agencies are not aware of concerns for marking the transmission line due to aircraft use. The analysis of the transmission line crossings in these areas considers the possibility of aircraft markings being necessary. The crossings of the river and highway are likely to be less than the existing tree height. A final review to determine whether aircraft markings should be installed on the line would be made following final design of the line when the location of poles and height of the line above the ground are completely known.

18TL No alternative will mitigate power lines from large raptors landing and wings touching two lines and result in death. (168)

Response: The spacing and configuration of conductors for the proposed transmission line would pose no threat to large raptors.

19TL The 19 habitat units for the transmission line are also incorrect. Little adverse effects will occur as a result of this transmission line corridor. The area will provide improved habitat for the bear with the improved foraging that will occur. (256)

Response: The 19 habitat units was incorrect. The agencies' revised analysis in the FEIS indicates that 463 habitat units would be affected by the proposed transmission line during the construction phase of the agencies' preferred Alternative 5.

Miscellaneous

20TL The transmission line for crossing this area is going to absolutely ruin the beautiful view. (6)

Response: Areas of high and moderate visual impact were designated for all alternative routes where they cross the Fisher River valley as shown on Figure 4-8. For Alternative 6, proximity to several residences, visibility of structures, and cleared right-of-way in the view from these residences and visibility of the line from U.S. 2 and a county road contributed to these impacts.

21TL The ground in the swampy area is unstable, some of it similar to quicksand. (6)

Reclamation of this area would be extremely difficult if not impossible. There is considerably more unstable ground involved in Alternative 6 than in 5. (6)

Response: The area of the crossing of the Fisher River by Alternative 6 would be more difficult than that at the crossing by Alternatives 4 and 5. This difficulty exists because of the active nature of the river and the presence of a wetland that cannot be avoided. Noranda has not identified any geologic constraints that would preclude construction on any of the transmission line routes. Additional design and geologic investigations would be conducted by Noranda to determine individual pole structure, footing, or foundation requirements. Specific site conditions may require that individual poles be moved up or down centerline or laterally within the 500-foot wide centerline. Alternative structure designs also may be required if problems are identified during final engineering design of individual pole sites.

22TL The precautions required of handling wire fences that would be contiguous with those which are directly below the planned are, at the very least, a nuisance and an irritation. (29)

Response: As discussed on page 381 of the DEIS, Noranda or the operating utility would ground metal fences close to the line. Typical industry practice is to ground fences that cross the right-of-way or parallel the line within 125 feet by installing a metal grounding post every 200 feet or so along the fence. This method would prevent any possibility of a serious shock hazard. If nuisance shocks are experienced when contacting a fence or gate, contact the local utility.

23TL Awful waste of electricity to put a 230 KV line to this mine. Power will come from coal, burned uselessly to make a large toxic waste site. The emissions will certainly combine in the air to form acid rain in MT and farther east. (31)

Response: The FEIS concludes that construction of the 230-kV transmission line along one of the four routes analyzed in detail would be the most environmentally and economically sound option. The Pacific Northwest Power Planning Council projects that as electrical demand continues to grow, the Northwest region could face electrical shortages. Such shortages could be met by electricity produced from new coal-fired power plants located somewhere in the region, or by other generation sources. If coal-fired or other power plants 50-MW or larger are constructed in Montana, review and approval under a separate environmental impact statement would be required.

24TL It is highly unlikely that powerline construction would take place during the winter in steep terrain with heavy snow cover. Also, potential impacts resulting from construction on winter range can be easily mitigated by timing activities to avoid critical periods. (139)

Pg. 210 [of the DEIS], states: First paragraph, the EIS should state what will occur, not what could occur. One cannot quantify impacts on what could happen. Power lines are to be constructed during the winter, the EIS should explain why it cannot be done during the summer. (171)

Response: Noranda's application for a transmission line is not clear about construction during the winter. Given Noranda's stated desire to have electrical power available as quickly as possible at the mine site, the agencies assumed that winter time construction was not precluded by Alternative 1. The agencies' intent was to clearly state that construction timing would be recommended to reduce effects to big game using winter range in the Miller Creek drainage. The analysis in the draft was to demonstrate the need for use of this measure.

25TL The DEIS should differentiate impacts to private ranches and residences from those to corporate timberlands. (139)

Response: Chapter 4 discusses the transmission line alternatives in terms of the environmental resources which would be affected by transmission line construction and operation.

26TL Whole approach up Libby or Ramsey creeks would not be worth trying to reach due to the crackling powerlines. A potential cancer-causing source not addressed in the DEIS. (168)

Response: Chapter 4 discusses the noise, electric fields, and radio and TV effects for the mine and transmission line. It should be noted that the transmission line would be only one of several mine components in the Ramsey Creek drainage (see *Mine Plan*, Chapter 2). The FEIS concludes that the noise generated from the transmission line would be barely to slightly discernible over ambient noise levels. The transmission line would pose no threat to public health or safety if constructed and operated as planned.

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LETTERS FROM AGENCIES, INDIAN TRIBES, AND ELECTED OFFICIALS

NAME [illegible]

ADDRESS Kootenai [illegible]

Answer requested immediately

COMMENTS:

1. [illegible]
down-stream [illegible]
no plan to [illegible] the Kootenai river [illegible]
2. [illegible]
monitoring [illegible]
and the release [illegible] process [illegible]
3. a worst case scenario is needed for [illegible] lead zinc
4. not enough attention has been [illegible]
content of the waste rock

United States Department of the Interior

GEOLOGICAL SURVEY
Water Resources Division
Federal Building, Room 428
301 South Park Avenue, Drawer 10076
Helena, Montana 59626-0076

TAKE PRIDE IN AMERICA

November 8, 1990

Mr. Ron Erickson
U.S. Forest Service
Kootenai National Forest
506 Highway 2 West
Libby, Montana 59923

Dear Mr. Erickson:

Thank you for the opportunity to review the draft environmental impact statement dated October 1990 for the Montanore Project. In the discussion of acid mine drainage on pages 190-191, disposal of waste rock from the barren zone into previously mined areas of underground workings is stated as being likely. On page 192, the potential adverse effects to water quality from this disposal are stated as being reduced if the acid-generating waste rock is placed below the post-mining water level.

Although placement below the water level may reduce potential adverse effects, such effects still could occur for several reasons. Considerable oxidation of the waste rock could occur before the post-mining level is established. In addition, ground water commonly contains dissolved oxygen and oxidation could occur even after the post-mining water level is established. Also, given the varied metal content of waste rock, conditions which may be restrictive to dissolution of some metals may not be restrictive to others. Therefore, careful consideration of geochemical conditions for all phases of waste-rock handling for all depths of potential disposal and potential solute movement may be warranted to help avoid adverse effects to ground-water quality.

If you have any questions concerning these comments, please feel free to call (449-5263).

Sincerely,

Joe A. Moreland

Joe A. Moreland
District Chief

#212

The Big Sky Country

MONTANA HOUSE OF REPRESENTATIVES

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COMMITTEES
STATE ADMINISTRATION
NATURAL RESOURCES
FISH & GAME

November 15, 1990

Ron Erickson
U.S.F.S Kootenai National Forest
506 Hwy 2 West
Libby, Mt. 59923

Dear Mr. Erickson:

My comments on the Draft Environmental Impact Statement Montanore Project will deal with two topics: grizzly bears and noxious weeds.

Grizzly bear: I support Noranda's proposed mitigation plan for its many sound ideas involving grizzly bear habitat (page 216). Road closures, habitat enhancement and protection and mortality reduction are logical and sound practices. Private land and habitat acquisition should be dealt with carefully and avoided if possible. Lincoln County has a great percentage of public lands and every acre taken out of private ownership tilts this lopsided scale. If you absolutely must acquire habitat by the purchase of private lands, then please explain why you couldn't enhance bear habitat on existing public lands. I am not willing to give up one acre of private land to the grizzly bear.

Spotted Knapweed: Every effort must be made to control spotted knapweed on your roads, cuts and activity areas.(p.228) You have recognized Canada thistle and St. Johnswort as potential problems also. I strongly recommend that you keep weed control a high priority plan.

Thank you for the opportunity to comment.

Sincerely Yours,

Mary Lou Peterson

Mary Lou Peterson

MLP/njr

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18th STREET - SUITE 500
DENVER, COLORADO 80202-2405

DEC 2 8 1990

RCVD JAN 3 1991

Ref: 8WM-SP

Robert L. Schrenk
Forest Supervisor
Kootenai National Forest
506 Highway 2 West
Libby, Montana 59923

Re: Draft Environmental Impact
Statement: Montanore Project,
Noranda Minerals, Corp., Kootenai
National Forest, Montana

Dear Mr. Schrenk:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, Region VIII of the Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the Montanore Project. EPA has attached Detailed Comments for your consideration during preparation of future NEPA compliance documents for this project.

EPA has several concerns with the DEIS. The proposed project area comprises 3,221 acres of mine permit area, 988 acres of transmission line corridor, and 1,225 acres of surface disturbance. There is the potential for the proposed project to result in a loss of several hundred acres or more of functional wetlands. EPA indicated these reservations in our May 17, 1990 letter to the Corps of Engineers when EPA recommended denial of the project as proposed.

EPA considers these losses to represent a significant adverse impact to the environment and concludes that the Forest Service must develop alternatives to avoid the adverse affects to special aquatic sites. Where avoidance is determined to be impossible, a detailed mitigation plan, with strong commitments, needs to be developed for inclusion in the NEPA document so that the reader can compare the ultimate impacts associated with each alternative.

In other instances the DEIS indicates that impacts to a particular resource cannot be defined. However, EPA could not locate in the DEIS information required by Section 1502.22 of the NEPA regulations regarding incomplete or unavailable information. Given the significance of this project's potential impacts and the lack of a clear demonstration in the DEIS that NEPA documentation of environmental impacts can not be provided, we object to the post-NEPA disclosure (via monitoring) of project impacts proposed in the DEIS.

EPA is concerned about the "Consequences of the Proposal" analysis which does not adequately address the direct and indirect impacts of the proposed project and its alternatives. The NEPA implementation regulations (40 C.F.R. Sections 1500-1508) require a thorough analysis of environmental impacts which will result from the project (Section 1502.16(a) and (b)). The DEIS states that Alternative 1 will violate surface water quality standards. The remaining two mine alternatives, Alternatives 2 and 3, say only that detailed plans will be developed to ensure compliance with surface water quality standards. The Forest Service needs to identify the specific means by which water quality standards will be maintained. These commitments, which will be necessary in the Mine Operating Plan, need to be fully documented in the supplemental NEPA document.

A major omission in the DEIS is analyses of the adverse impacts which could result from subsidence at the mine and resultant modification of the overlaying wilderness ecosystem. There is substantial reason to believe subsidence to the surface could occur. The resultant modifications to visual and hydrologic conditions on the surface need to be fully documented. EPA believes a revised mine plan is needed that assures that subsidence will not occur.

EPA is also very concerned over the lack of information addressing Air Quality impacts, especially cumulative impacts. Again, information must be provided that will satisfy Section 1502.22. The DEIS fails to show why this project will not be subject to prevention of significant deterioration (PSD) requirements. It also fails to discuss increment consumption for particulate matter (PM-10) and for fugitive emissions.

Based on the procedures EPA uses to evaluate the adequacy of the information presented in the DEIS and the environmental acceptability of the impacts portrayed for the various alternatives, EPA has rated the Montanore Project DEIS EU-3 (environmentally unsatisfactory-inadequate information). The project, as presented in the DEIS, is environmentally unsatisfactory because of the magnitude of avoidable and unmitigated impacts associated with the proposed action. The numeric designation "3" means the DEIS does not contain adequate information to assess whether reasonable alternatives are available which would reduce the environmentally significant project impacts. Further, the DEIS does not clearly address the potential adverse environmental impacts on wetlands, wilderness areas, water quality, or groundwater flows.

EPA is recommending a Revised or Supplemental DEIS be prepared which addresses all deficiencies. In the enclosed detailed comments, EPA has identified additional information, analyses, and discussions needed to fully document the environmental impacts of the proposed action and alternatives to that action.

If the issues raised in our comments are not resolved in the Revised Supplemental DEIS, this proposal is a candidate for referral to the President's Council on Environmental Quality. Also, as indicated in our comments on the Section 404 permit, the project as proposed is subject to EPA's authorities under Section 404(c) of the Clean Water Act. If you have any questions concerning our comments, please contact me at (303) 293-1603 (FTS 330-1603) or have your staff contact Jeff Bryan in our Montana Office at (406) 449-5486 (FTS 585-5486).

Sincerely,

James J. Scherer
Regional Administrator

Enclosures: Detailed Comments
Description of Ratings

cc: John W. Mumma, USFS
Stan Stephens, Governor
Dennis Casey, MDSL
William Opitz, MDHES
Karen Barclay, MDNRC
Max Baucus, Senator
Conrad Burns, Senator
Pat Williams, Congressman

RCVD
JAN 3 1991
Kootenai National Forest
Libby, Montana
59923

U.S. ENVIRONMENTAL PROTECTION AGENCY
MONTANORE PROJECT
DRAFT ENVIRONMENTAL IMPACT STATEMENT
DETAILED REVIEW COMMENTS

SPECIAL AQUATIC SITES:

No information was provided in the DEIS concerning a documented wetlands delineation/evaluation. Consequently, the alternative analysis does not document all direct and indirect impacts (as required by 40 C.F.R. Section 1502.16) which would result from implementation of the Applicant's proposal. CEQ specifically addresses the uncertainty situation in Section 1502.22, Incomplete or Unavailable Information. It would appear that additional wetlands impacts may occur from the activities planned in watersheds other than Little Cherry Creek, such as the ore processing station and mill percolation ponds along Ramsey Creek, the road network, and the electric transmission line. No information has been presented in the DEIS regarding other dredge and fill activities, compliance with 404 requirements other than the tailings impoundment, avoidance of wetlands impacts and wetland impact mitigation.

Since a major impact of the proposed project is the direct destruction of a special aquatic site, EPA has serious reservations concerning implementation of the project. EPA indicated these reservations in our May 17, 1990 letter to the Corps of Engineers when EPA recommended denial of the project as proposed. The following discussion describes the process which EPA feels is required to complete an adequate NEPA document for the purposes of the Section 404 permit. EPA believes the DEIS clearly lacks this level of analysis and therefore must be revised or supplemented.

The Clean Water Act declares the national goal of elimination of the discharge of pollutants into waters of the United States. Since this goal was to be met by 1985, it is clear that all agencies need to strive, to the maximum extent possible, to avoid the discharge of pollutants to the nations waters whenever possible. This goal is implemented by Section 301 of the Act which states that such discharges are unlawful, except in compliance with, among other sections of the Act, Section 404. Section 404 only allows discharge of dredge or fill material when the discharge complies with the Section 404(b)(1) Guidelines. This statutory scheme makes it clear that discharges are not allowed except under a certain limited set of conditions.

Fundamental to the Section 404(b)(1) Guidelines is the precept that dredged or fill material should not be discharged to the aquatic ecosystem, unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact. This determination must include analysis of other known and/or probable impacts of other activities affecting the ecosystems of concern.

Section 230.10(a) of the guidelines stresses that no permit should be issued if there is a practicable alternative that is less damaging to the aquatic ecosystem than the proposed project (the alternative itself should not have other significant environmental effects). This analysis of alternatives should:

1) define the overall, or basic, project purpose. If the project has several purposes, each purpose needs to be addressed separately.

2) determine if it is necessary to construct the project in an aquatic ecosystem in order to achieve the basic project purpose. If it is not necessary to construct the project in an aquatic ecosystem to accomplish the basic purpose (that is: the basic project purpose could be met by constructing a project in an upland site), the project proponent must clearly demonstrate that the proposed project has less adverse impact on the aquatic ecosystem than upland alternatives which would meet the basic purpose of the project.

3) examine all available alternatives and determine which alternatives are practicable. For multi-purpose projects, alternatives should be examined separately for each of the basic project purposes. Permits should only be considered for those portions of the project which require construction in an aquatic ecosystem to meet basic purpose of that portion of the project.

4) examine the environmental impacts of each practicable alternative. If any of the practicable alternatives result in less environmental damage to the aquatic ecosystem (and do not result in other significant environmental impacts) the permit for the proposed project should not be issued.

Section 230.10(b) of the Guidelines stresses that no permit should be issued if the project would:

1) cause or contribute to a violation of any State water quality standard.

2) jeopardize the continued existence of a threatened or endangered species.

Section 230.10(c) of the Guidelines stresses that no permit should be issued if the project would significantly, adversely affect:

1) human health or welfare;
2) animals which depend on aquatic ecosystems;
3) aquatic ecosystem diversity, productivity and stability;
4) recreation, aesthetic and economic values.

Section 230.10(d) of the Guidelines stresses that no permit should be issued unless all appropriate and practicable mitigation steps have been taken to minimize potential adverse impacts on the ecosystem. The DEIS fails to address and satisfy these Clean Water Act requirements both from an alternatives and impact analysis perspective.

WATER QUALITY:

There are several assumptions associated with the water quality impact analysis which are either incorrect or inadequately documented. Further documentation will be necessary for an adequate assessment of potential water quality impacts. On page 185, a statement is made that since, for some metals, the standard is below detection limit, the detection limit "...is effectively the standard". This is not correct. Standards (criteria portion) may not be based on levels of quantitation or detection, cost-benefit analyses, or availability or cost of treatment. The standard is based on environmental effect, and it does not matter whether or not the effect value (standard) is below the analytical detection limit. The regulatory role of the detection limit is in establishing permit compliance thresholds where the calculated permit limit is below detection.

The incorrect assumption about the equivalence of standards and detection limits appears to be carried over into the modeling of expected water quality impacts. For example, in Table 4-18 the projected water quality for arsenic, lead, mercury and silver is listed as below detection rather than a specific projected water quality concentration. Based on this approach to water quality impact assessment, it is difficult to determine whether or not discharges from the mine will violate water quality standards. There are several ways of addressing the detection limit assumptions in estimating background and effluent quality, but once those assumptions are made, the modeling should predict an instream concentration that will be compared to the standard and not the detection limit.

Calculationa of discharge concentrations should be based on total recoverable metals. The EPA water quality criteria for metals are based on total recoverable metals, which utilizes a digestion process to measure metals in dissolved and particulate form. EPA criteria (expressed as total recoverable metals) have been adopted in Montana Water Quality Standards. The metals values reported in the DEIS, however, are dissolved metals. There can be significant differences between these two means of reporting ambient metals values if there is a significant fraction of metals in the particulate form.

EPA recommends that ambient metals levels, at least in surface waters, be identified and monitored using total recoverable analytical techniques (e.g., the information displayed in Tables 4-9 and 4-10 should be as total recoverable, ambient monitoring in Libby Creek, Ramsey Creek and Little Cherry Creek should include total recoverable metals levels). Even if the expected discharge route is via groundwater, total recoverable metals should be evaluated to allow analysis under a high impact scenario, particularly given the significance of potential impacts. Again, the more rigorous digestion provides an estimate of the fraction of metals in the discharge that are biologically available both at the time of discharge and that may become available after discharge. One of the contingency plans for handling excess water discharges indicates Noranda will apply for a NPDES permit if a surface water discharge is needed. Federal permitting requirements specify the total recoverable digestion procedure as a basis for establishing permit limits.

The DEIS states that increased concentrations of copper, manganese, mercury and silver are anticipated as a result of the proposed mine operation. As explained on page 190, a critical assumption in assessing impacts to water quality is whether or not the mine water discharge and tailings seepage remain non-acidic. The information on acid forming potential presented in the document is inadequate. EPA would like more information on how successful and accurate the testing of the ore body for acid mine drainage production potential is. EPA suggests that Noranda raise this issue with the EPA Mine Waste Task Force to request Task Force opinions and recommendations.

The document includes a discussion about the limitations of applying the EPA hardness-based toxicity equations at the very low surface water hardness in the Libby Creek basin. We do not, necessarily, disagree with the conclusion that the validity of the EPA equations is uncertain at very low harnesses. That does not, however, eliminate the need to evaluate metals toxicity at these very low hardnesses. The EPA equations do demonstrate an inverse relationship between toxicity and hardness. That relationship coupled with the somewhat acidic pH levels in the Libby Creek basin would suggest that actual metals toxicity may be greater than that predicted by the EPA equations at a hardness of 20 ppm. There are methods available to make site-specific estimations of local water effect on toxicity (see, e.g., EPA's Water Quality Standards Handbook). To ensure adequate impact analysis and public disclosure of potential impacts under a high impact scenario, the revised/supplemental DEIS should provide a more complete assessment of the potential for increased metals toxicity in the Libby Creek basin.

The DEIS also states that the State Board of Health and Environmental Sciences will be petitioned under the Montana Nondegradation Rules to allow degradation of existing high water quality in Libby and Ramsey Creeks because of necessary social and economic development. It is also stated that it may take several decades for metals from ground water seepage to discharge into Libby Creek. Metals levels can exert toxic effects at very low levels particularly in the soft waters existing at the mine site. It is EPA's opinion that the complexities associated with this mining operation and ground water movement are such that it is difficult to accurately project whether increased concentrations of metals will not exceed surface water criteria or cause some toxic effect at some point in the future. Will a monitoring plan remain in place long enough to detect future discharges to the Creek (i.e., after the 16 year period of mine operation)? Who will monitor? How will it be paid for? Could chronic toxicity tests with Ceriodaphnia be incorporated into the monitoring plan? EPA may be able to identify and recommend other bioassay or toxicity tests that would be appropriate for the very soft waters existing at the mine site (if Ceriodaphnia chronic toxicity testing is inappropriate in very soft waters).

EPA recommends a more explicit identification of responses to be taken by Noranda if monitoring evidences water quality criteria violation or toxic effects. What will happen if toxic effects or criteria violations are identified after the sixteen year period of mine operation? Will adequate bonding provide for remediea and corrective action that may be needed in the future? Will an adequate portion of the reclamation bond be held after mining and reclamation are completed to address possible future degradation, violations or toxicity that shows up decades into the future? These issues need to be addressed to ensure that future environmental impacts and Federal liability are at acceptable levels.

EPA has also determined another issue associated with the tailings impoundment. The permanent diversion channel design appears to only consider flow conveyance and channel stability. A permanent diversion channel necessary to bypass stream flows should include creation of stream channel forms associated with aquatic habitat such as alternating pool/riffle complexes. As now proposed, construction of a permanent diversion around the tailings would effectively eliminate fish migration and residency through the diverted reach, and it is predicted that, at very low flows, the diversion would eliminate habitat for rainbow trout in upper Little Cherry Creek. Montana's nondegradation rule requires that a project proponent for an activity that will degrade water quality demonstrate that the change "...will not result in violations of water quality standards or preclude existing beneficial uses or diminish anticipated beneficial uses of the receiving water" (see 16.20.704). Although there is a discussion of projected change in ambient water quality, Noranda's intention to petition the Board for approval of that change, and likelihood of standards violations, there is no discussion of how the diversion, as proposed, will satisfy the exiting use protection requirement of Montana's nondegradation rule. EPA will send, under separate cover, a copy of the recently prepared draft of Placer Mining Reclamation Guidance Document prepared for EPA by Inter-Fluve, Inc. This draft guidance document includes information on incorporating aquatic habitat considerations in stream channel reconstruction, as well as other aspects regarding reclamation such as revegetation, erosion control, etc.

Alternative three proposes the concept of using artificial wetlands to treat waters containing heavy metals. EPA believes that the long term disposition of the toxic metals that accumulate in the wetlands should be discussed. Are the proposed artificial wetlands, saturated with elevated levels of toxic metals, to be left in perpetuity? What impacts will this exert on ground water quality, the ecosystem? In addition, it appears that the USFS believes the wetlands will operate at over a 90% efficiency in the removal of pollutants. Does the USFS have information which will support this level of treatment success, especially over long periods of time?

The DEIS fails to discuss the applicability of Section 402 of the Clean Water Act (National Pollution Discharge Elimination System -- NPDES) and the need to obtain a NPDES permit for discharges of pollutant into waters of the United States from the tailings impoundment, rock piles, surface irrigation, and other sources. The lack of information dealing with mine water impacts and potential NPDES requirements needs to be provided in subsequent NEPA documentation.

EPA is concerned about the potential degradation of surface water quality from mine failure (subsidence - see below), oxidation of sulfides in mine development waste rock (acid mine drainage source material), and mine drainage other than adit drainage. EPA is concerned about the absence of reported hydrological data including mine ground water data and mine ground water quality baseline data. Specifically, what is understood about hydrological data which, if incomplete, could significantly impact the overall site water balance? What are the potential impacts if the water balance assumptions are understated? A complete design with contingencies does not exist. Will there be a binding agreement on Noranda if their plan fails?

CATASTROPHIC ADVERSE ENVIRONMENTAL IMPACTS:

The DEIS does not address the adverse environmental impacts which would result should subsidence to the surface occur either during or post closure of the mine. Given the faulted nature of the geological formations at the mine site, and previous examples of major subsidence at underground hard rock mines in the west, EPA believes it is reasonably foreseeable that subsidence to the surface could occur. An example of a hardrock mine failure would be Copper Range's White Pine mine (a similar room and pillar design at a depth something less than Montanore's proposed mine workings). The risk of pillar failure leading to surface subsidence at Montanore is at least as great as White Pine due to structural and fracturing considerations. The Montanore pillar columns are three times the height of White Pine's and significant faulting has occurred in rock adjacent to two parallel headings. The revised/supplemental DEIS should discuss faulting and rock fracture patterns in the mining foot and hanging walls, the ore body, and in the Rock Creek fault.

EPA believes that without cemented wasterock/tailings backfill material in place, a possible scenario of mine flooding via rock fracture/faulting flows, weakened structure failure and caving to the surface, surface subsidence above the mined-out area, acid formation in open and flooded stores filled by surface subsidence, snowmelt drainage and loss of Rock Lake and nearby lakes to surface subsidence will exist. EPA thereby believes the environmental impacts of such subsidence within the wilderness area are unacceptable.

The CEQ regulations (40 C.F.R. 1502.22) require the lead agency, providing that the analysis of impacts is not based on pure conjecture, to document the impacts of such catastrophic occurrence even if the probability of subsidence occurrence is low. EPA believes there is credible scientific evidence (i.e. previous examples of subsidence) on which to base the impact analysis if subsidence within the wilderness area should occur. At a minimum, adverse visual impacts and environmental impacts of alteration of the existing drainage patterns which would result from subsidence needs to be evaluated.

AVOIDABLE IMPACTS:

The DEIS does not included analysis, other than the no action alternative, of alternatives which would avoid and/or reduce the impacts to special aquatic sites. This analysis is required by the Guidelines to Section 404 of the Clean Water Act. In particular there is no analysis of alternatives to elimination of the special aquatic sites located at the tailings pond site. One obvious alternative would be to replace some or all of the

tailings back into the mine rather than discharging the tailings to the Little Cherry Creek valley. This alternative would also possibly provide some opportunities to reduce the risk of subsidence.

AIR QUALITY:

The DEIS states that the project will not trigger Prevention of Significant Deterioration (PSD) review, because no criteria pollutant will be emitted in excess of 250 tons per year. Emissions estimates provided in Table 6-2 appear to support this conclusion. However, the Table does not indicate whether the projected emission rates are based on total potential emissions or on emissions restricted by pollution equipment or operational limitations. PSD review is triggered by construction of a "major source"--a source which has the potential to emit 250 tons per year of a criteria pollutant.

"Potential to emit" is defined as the "maximum capacity of a source to emit a pollutant under its physical and operational designs." A physical or operational limitation--such as use of pollution control equipment or a limit on hours of operation or production--will be factored in to reduce potential emissions if such limitation is part of federally enforceable permit. Therefore, if the emission rates in Table 6-2 are not based on unrestricted potential emissions, Noranda must obtain air permits from the State of Montana which effectively restrict the emissions below 250 tons per year. Otherwise, the emissions of nitrogen oxides (NOX) or carbon monoxide (CO), in particular, may be sufficient to make the project a major source subject to PSD permit review. If the Montanore project becomes a major PSD source, then on-site meteorological data would be required for complex terrain analysis.

Even if it is not a major source, the project will be subject to New Source Review provisions which require demonstration that there will be no interference with attainment or maintenance of a national standard. New Source Review provisions also require that the projects air pollution emissions not be allowed to increase ambient concentrations in excess of the National Ambient Air Quality Standards (NAAQS), nor consume the PSD Class I and Class II nitrogen oxide, total suspended particulate (TSP) or the forthcoming PM-10 increment.

The predicted PM-10 concentrations for the plant site are high--33.6 micrograms per cubic meter for a 24-hour period. This level appears to be very close to the proposed increment limit for Class II areas, 37 micrograms per cubic meter. The plant's emissions will impact the Cabinet Mountains Wilderness, a Class I area. The proponent estimates that the impacts of the plant's PM-10 emissions will be 9.0 micrograms per cubic meter. This is very close to the proposed increment for Class I areas, 10

micrograms per cubic meter for a 24-hour period. The project may actually consume all the increment, if the modeling receptor site used by Noranda is not the site of maximum concentration. In the revised/supplemental DEIS, a detailed map showing the locations and elevations of the Class I receptors, along with stack parameters and plume rise calculations should be included.

Presently, both the Class I and Class II limits are for TSP. Under the Clean Air Amendments of 1990, the PSD increment for particulate matter has been changed to PM-10, a subset of total suspended particulate. EPA will be promulgating new PM-10 increments which will be significantly more stringent than the current TSP increments. Therefore, the possibility of exceedance of either the Class I or Class II increments for PM-10, or both, is substantial. The Montana Department of Health and Environmental Sciences may not permit an air pollution source which will cause exceedance of PSD increments.

The DEIS does address the secondary impacts of the project to the air quality of Libby, Montana. Libby is presently a Group I area for PM-10 and it is in violation of the PM-10 NAAQS. The predicted increase of PM-10 from the Montanore project from 256 ug/m3 to 270 ug/m3 is unacceptable and is in direct conflict with the PM-10 State Implementation Plan (SIP) that the State of Montana is developing. The Montanore project should develop offsets to their PM-10 emissions, so that there is no net increase in the PM-10 concentrations to the Libby area.

The DEIS fails to discuss combined PSD increment consumption, and NAAQS impacts by the Noranda Montanore project, proposed ASARCO Rock Creek mine project, and proposed Forest Service timber sales within the same area. If Noranda's project consumes all the PM-10 increment in the Wilderness, the ASARCO project may be foreclosed. If not foreclosed, the cumulative impact may cause an exceedance of the PM-10 increment.

In 1990, EPA promulgated PSD increments for nitrogen dioxide. The increment is 2.5 micrograms per cubic meter for Class I, and 25 micrograms per cubic meter for Class II, on an annual average. Again, the predicted concentrations from the Plant site--and from the Libby Creek adit--will likely not cause violation of the Class II increment, but may well cause violation of the Class I increment in the Wilderness. The nitrogen dioxide increment is not even discussed in the DEIS. If this project is to be a minor source, then the State permit needs to include a Federally enforceable emission limit to keep NOx and CO emissions below the 250 TPY PSD criteria. A cumulative analysis of other sources in the Class area permitted after Montana has adopted the nitrogen dioxide PSD increment also needs to be addressed. The DEIS does not include a visibility analysis to assess the visual impact into the Class I wilderness area. Subsequent NEPA documentation should include this analysis.

The report shows that lead emission levels will be low, but does not provide emissions estimates for other heavy metals--arsenic, cadmium, zinc, etc.--which are likely to be present in the ore and in fugitive emissions from waste rock piles and the tailings impoundment, among other sources. Since these pollutants have toxic effects on human beings and wildlife, Noranda should provide more data, not just an unverifiable statement that "modeled concentrations are less than the adopted [state] guidelines."

The report also fails to provide estimates of fugitive emissions from the tailings impoundment after closure, when the impoundment will continue to dry out without further additions of mine and process water. The proposed use of sprinklers may reduce emissions from the impoundment during the life of the project. However, the project life is only 16 years, while the tailings impoundment and other disturbances will continue indefinitely (or until clean-up under Superfund). Provision must be made for reducing particulate emissions from the impoundment after closure, especially since the emissions will contain heavy metal particulates, which may have adverse impacts on wildlife and human health. The DEIS provides no discussion of this issue.

SUMMARY OF ' TING DEFINITIONS AND FOLLOW-UP ACTION*

Environmental Impact of the Action

LO—Lack of Objections
The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC—Environmental Concerns
The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO—Environmental Objections
The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU—Environmentally Unsatisfactory
The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of environmental quality, public health or welfare. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1—Adequate
EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2—Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3—Inadequate
EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From: EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

Department of Energy
Bonneville Power Administration
PO Box 3621
Portland, Oregon 97208-3621

DEC 7 1990

In reply refer to EFBG

Mr. Ron Erickson
Kootenai National Forest
506 U.S. Highway 2 West
Libby, MT 59923

Dear Ron:

The Bonneville Power Administration (BPA) has the following comments on the Noranda Montanore Project Draft EIS.

1. Due to technical problems, not all of our comments on the review draft were incorporated. As we have discussed, we want them included in the FEIS. If any of those are not clear on the second copy I sent you, please let me know.

2. On page 13 of the DEIS, please insert the following at the end of the first sentence after BONNEVILLE POWER ADMINISTRATION. . . . on its Libby-Noxon line, to a distribution utility as BPA is prohibited by law from serving the mine load directly.

If you have any questions, please contact me.

Sincerely,

Phil Havens

Phillip D. Havens
Environmental Specialist

KOOTENAI TRIBE OF IDAHO
P.O. BOX 1269
BONNERS FERRY, IDAHO
83805
208/267-3519 or
208/267-5223

December 6, 1990

Kootenai National Forest
United States Forest Service
506 Highway 2 West
Libby, Montana 59923

ATTN: Ron Erickson

Re: Noranda Minerals Corp., Montanore Mine Draft Environmental Impact Statement

Dear Sirs:

What follows is the response of the Kootenai Tribe of Idaho to the above noted Draft EIS.

This proposal has the potential to affect the Treaty Rights of the Kootenai Tribe of Idaho in severe, negative ways over many decades.

The area in question is a subsistence area for the Tribe: specifically, huckleberry gathering, big game hunting and stream fishing. The Kootenai Nation has used the area since time began, is using it today, and expects to continue using it forever. The Draft EIS does not, in our opinion, offer adequate safeguards for our Treaty Rights.

To the Kootenai Nation, including the Tribe, the Kootenai River is the heart and lifeblood of its continuing survival. At present we are in the process of building an experimental Sturgeon Hatchery, with the goal of restoring the legendary Kootenai White Sturgeon to its rightful place in the ecosystem of the River. The Montanore Mine, as proposed in the Draft EIS, has the potential to impact the River and our hatchery program profoundly, destructively, and permanently.

The concept of a mine of this magnitude in and under pristine high country, in an area of great historical and religious significance to the Tribe, offends our spiritual and aesthetic sensibilities utterly.

For these reasons, the Tribe regards Alternative 7 of the Draft EIS as the clear alternative of choice. (No Action).

However, acknowledging economic reality, the Tribe reluctantly recognizes that this may not be possible. Accordingly, we have carefully and thoroughly reviewed the Draft EIS.

We have regretfully come to the conclusion that the Draft EIS, as published, is an inadequate document. It fails to provide enough information to enable us to come to an informed decision regarding Alternatives 1 through 6. In a number of areas of concern to us, such as acidification potential, acid precipitation effects, impact on the Kootenai River, and concentrates transport, the Draft EIS either ignores the issue or suggests that we can wait until the mine is operational and then find out what will happen. We do not believe this is appropriate, given the magnitude of the project.

We therefore have no option but to oppose the mine in its entirety as proposed, until the Draft EIS is expanded to include information presently unavailable.

We have listed herein some of the questions for which we could find no adequate answers in the Draft EIS.

1. Why does the Draft EIS fail to address the issue of the Treaty Rights of the Kootenai Nation?

2. Each of the performance bonds Noranda is required to deliver must be large enough to make it uneconomical for the Company to forfeit any of them. Is this the case?

3. Noranda Minerals' parent company is a foreign corporation. What mechanism will protect downstream interests such as ourselves throughout (a) the life of the tailings impoundment; and (b) as long as water is draining from the mine?

4. What benefits, if any, will accrue to the Tribe from the Montanore Mine? Affirmative action hiring at all levels? Training for technical and managerial jobs?

5. The Libby Creek Adit is being worked on right now. What is Noranda doing with the waste rock and mine water? What monitoring, if any, is being done? Are the results of those tests available to us?

6. We are told that the orebody lies under several lakes, between two major faults, in an area of multiple sub-

faults. What tests have been done to identify probable problem areas?

7. The Draft EIS refers to a 'halo' of low-grade galena surrounding the orebody, and veins of galena and pyrite in the waste rock. Where are the assay results?

8. Will the metal-bearing waste work be used in site and tailings impoundment construction? What measures are in place to ensure that this does not happen? How will it be stockpiled to avoid metal leaching from acid precipitation?

9. Will the results of ongoing waste rock assays be made available to interested parties such as ourselves?

10. What does Noranda propose to do with surplus mine water in the highly probable event that the mine produces much more than the projected quantity of water?

11. According to the Draft EIS, the mill and surface workings will be located above and alongside Ramsey Creek, across the creek from the Adits. Figure 2-9 shows no diversion ditch to protect Ramsey Creek from slope runoff, spills, etc. Why not?

12. What precautions will be taken to protect the creek at the road crossing? Traffic there will be heavy.

13. How close to the workings is Ramsey Lake? How will it be protected?

14. What are the specifications of the crusher-to-mill conveyor? It will be carrying 20,000 tons/day of wet crushed ore. How will the creek be protected?

15. What are the specifications of the sewage treatment plant? What process will be used? Where will the effluent go? What will be done with the solids?

16. What chemicals will be used in the Assay Office?

17. How will assay office wastes be disposed of?

18. How will the tailings get from the mill to the thickener?

19. Will the ore stockpile be roofed to protect it from acid precipitation?

20. We have grave misgivings about the reagents Noranda proposes to use, particularly because the Draft EIS provides so little information about them, and even the information provided to us by NFS is inadequate for our purposes. We need to know:

(a) What is the toxicity of these reagents to aquatic life? To game? To plants?

(b) How much of each reagent will be in the tailings? In the concentrates?

(c) What is the half-life of each?

(d) What are their products of decomposition?

(e) Over what period of time, under what conditions of temperature, light, etc. do they decompose?

(f) What kind of bioavailability do they and their break-down products display?

(g) At any stage in the process of decomposition, are they synergistically toxic with each other or with other substances present in the tailings?

(h) How will the reagents be transported to the site, and what will be done with the empty containers?

21. What are the specifications of the ditch parallelling the tailings pipelines? Will it be lined with an appropriate impermeable material? What?

22. The Project Water Balance (Figure 2-12) shows 671 gpm of water from the tailings impoundment to the mill. Does this mean that Noranda is committed to pumping 671 gpm of tailings impoundment water 5 miles up the hill during the life of the mine, whether they have surplus mine water or not? Why is this pipeline not discussed in the Draft EIS nor shown in any of the diagrams?

23. Still referring to Figure 2-12, what is the estimated embankment seepage rate in Year 10?

24. More detail is required regarding the proposed runoff diversion channel into Bear Creek. Why must Bear Creek be impacted? What are the specifications of this diversion channel?

25. As far as we have been able to learn, Noranda has applied for only one '404' permit from the Corps of Engineers. It is for 0.9 acres of wetland in Little Cherry Creek at the impoundment site. This seems to us to be a very conservative figure, given the size and location of the impoundment. Has the wetland been surveyed by anyone beside Noranda?

26. On page 64 of the Draft EIS, other wetlands are implied. Where are they?

27. Why does the Draft EIS not include a topographical map of the impoundment area and surface workings area, printed in a scale large enough to be read? We need one, with the proposed disturbances accurately drawn in.

28. Alternatives 2 and 3 speak to some of our concerns about water quality, but not in sufficient detail. (We do not consider Noranda's proposed pressure relief/seepage collection system to be even remotely adequate). The Draft EIS refers to the use of plastic or other synthetic materials to prevent groundwater contamination, or rather, to alleviate it. What plastics are envisioned, what are their useful lifetime, break-down products, and persistence characteristics?

29. Will the emergency power generating capacity of the project be increased to keep the impoundment pumps and water treatment equipment operating in the event of power failure?

30. What mechanisms will Noranda put in place to respond in the event of a 'worst case' scenario such as prolonged power outage, massive tailings spill, multiple pump breakdown or other manifestation of Murphy's Law?

31. After Year 16, is Noranda committed to continuing treatment of tailings impoundment water for as long as necessary? How will this be done, if they propose to tear down the power line?

32. It is unacceptable for the Draft EIS to dismiss post-operational water discharges from the mine and tailings impoundment as 'unpredictable at this time.' Some extrapolation from known data should be possible, and this information is needed, given that these water discharges are going to continue for a very long time.

33. Tailings effluent data from the Asarco Troy Mine has been used in the Draft EIS to model predictions for Montanore. Where is the assay data for the orebody, host rock and waste rock from the Troy Mine? Is Asarco using the same reagents, in the same proportions, at Troy?

34. How long after year 16 is Noranda committed to monitoring? How will this be enforced?

35. Will the loading site at Libby be monitored? How? Safeguards outlined in the Draft EIS are inadequate.

36. Is Noranda prepared to do baseline and ongoing water quality monitoring, and sediment tests, on the Kootenai River at Libby and downstream at least as far as Troy? In our opinion, this is absolutely essential.

37. What traffic control measures does Noranda propose to minimize the probability of concentrates truck accidents?

38. What mitigation and clean-up process is planned by Noranda, if a concentrates truck overturns and spills?

39. Where do the concentrates go from Libby?

40. What kind of rail cars will be used?

41. We note on page 111 of the Draft EIS the statement "Cadmium in all surface water samples resulted from sample contamination; analytical results do not reflect baseline conditions". We find this statement astonishing. Why, if the samples were contaminated, were they not discarded and new samples taken? How many samples were contaminated? At what stage in the sampling/testing process? What other contaminants may have entered the samples (and other samples)? Accurate baseline data is essential; we suggest that the sampling process needs to be repeated, using another clearly disinterested, testing laboratory.

42. The Draft EIS fails to address the fact that copper and zinc are synergistically toxic to fish. While projected concentrations of each may be within acceptable limits by themselves, what is the toxicity of the two metals together? Given the presence of both copper/silver ore and galena, this is a very important issue.

43. On page 71 of the Draft EIS, in the discussion of a wetlands water treatment system, is the comment that 'vegetation may require replacement as it becomes saturated with metals'. If a moose comes along and eats this metal-saturated vegetation, what happens to the moose? What happens to the tribal member who shoots and eats the moose?

44. If there is uptake of metals by vegetation in a wetland, presumably there is uptake of metals and mill reagents in seepage water from a tailings impoundment. This issue needs to be properly addressed.

Answers to these questions may, sadly, do nothing more than generate additional questions. It is imperative to us at this time, however, to seek these answers so that we might, in the interest of our Treaty Rights, have available to us sufficient information to better understand the true impacts of the proposed project. This is nothing more, and we seek nothing less, than that which is required to understand the real impact upon our rights and the rights of the Kootenai Nation not only today but for the generations unborn.

THE KOOTENAI TRIBE OF IDAHO

Per:

Raymond Abraham
Raymond Abraham, Chief

Velma Bahe, Chairperson

RA:VB:PF/tlh

Montana State Senate

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The Big Sky Country

COMMITTEES
LOCAL GOVERNMENT
STATE ADMINISTRATION

0129L559923
1LMT

December 8, 1990

Ron Erickson
U. S. Forest Service
Kootenai National Forest
506 Highway 2 West
Libby, Montana 59923

Dear Mr. Erickson:

I am submitting this letter in support of the Noranda Project. I think with our rich source of minerals it is only realistic that we pursue our economic future in regard to these.

I believe Noranda has been very cooperative and responsive in regard to needs and protections for our water and wild life. We are all very much interested in keeping our water and air clean and I believe Noranda is using every means possible to make sure this is done.

As for the wildlife habitat, Noranda has expressed a sincere effort to cooperate in this matter and I am not in favor of them being required to purchase 5,000 acres of private land and turn it over to the Forest Service. Our tax base is erroding fast enough without taking such a large area out of the tax base. Their proposal to obtain conservation corridors and help pay for Fish, Wildlife and Parks personnel to monitor the issues would be adequate protection.

With the economy of Lincoln County as it is I believe we should cooperate with a company like Noranda to develop a project that would mean jobs and a better future for Lincoln County rather than continue to throw road blocks in the way of this development.

Sincerely,

Senator Eleanor L. Vaughn
Senator Eleanor L. Vaughn

cc: Noranda Minerals Corporation

0135L659923
3LMT

BOARD OF COUNTY COMMISSIONERS
LINCOLN COUNTY
STATE OF MONTANA

DISTRICT NO. 1, LIBBY
JIM R. MOREY

DISTRICT NO. 2, TROY
LAWRENCE A. (LARRY) DOLEZAL

DISTRICT NO. 3, EUREKA
NOEL E. WILLIAMS

CLERK OF THE BOARD AND COUNTY RECORDER, JANET B. F. SIEGEL
512 CALIFORNIA AVENUE
LIBBY, MONTANA 59923

December 11, 1990

RCVD
DEC 11 1990
Kootenai National Forest
Libby, Montana
59923

Ron Erickson
Kootenai National Forest
506 Highway 2 West
Libby, MT 59923

Dear Ron:

We would like to submit comments on certain aspects of Noranda Minerals Corporation's Montanore Project. We are committed to the pursuit of a balance of maintaining our quality of life while considering potential development of our natural resources in Lincoln County that will not adversely impact our environment beyond tolerable levels. Concerning many of the technical details covered in the DEIS, we admit we are not experts, so we will approach this from a layman's perspective.

One major area of concern is the impact upon the water quality within the affected drainages from this project. We have consulted professionals both from a technical perspective and a common sense, good-neighbor approach. They admit there will be degradation of the water, but they assure us that this proposal includes a technical plan that they are confident will still support a healthy aquatic ecosystem. They feel that this proposal will keep any water degradation well within tolerable levels that will sustain a healthy aquatic environment which includes insect, plant life and fish populations.

Another point that has generated a lot of controversy is the impact of this project on the grizzly bear. Just recently the proposed Revised Grizzly Bear Recovery Plan has indicated that if no grizzly bear crossings can be verified from the Cabinets to the Yaak through the Kootenai River gorge that the Cabinets portion of the Cabinet-Yaak Ecosystem would not be large enough to be considered a viable area to sustain a recovered population of grizzly bears without applying "intrusive" management techniques. If there are only 15 estimated grizzly bears in the Cabinets, and only three of them documented to have crossed through this area, in numbers it seems we are dealing with an extremely small portion of the overall occupied grizzly bear habitat within the Cabinets. The DEIS also states that the quality of replacement habitat for grizzly bear mitigation is uncertain, and that it is conceivable that only below average habitat would be available for purchase. Since these things and many other factors surrounding this whole grizzly bear recovery effort are still undeterminable it does not make too much common sense to unduly stradle Noranda with the financial burden of purchasing replacement habitat that may not be useful, needed or even viable. Lincoln County is already over three quarters federal ownership, and another five thousand acres of private lands removed from our tax base would be one more negative impact that would further erode our local economy that is currently struggling.

We could pursue other points in a similar manner, but what it all boils down to is whether or not we are willing to put the laws of the State of Montana to the test that were enacted to ensure that our quality of life and environment will not be adversely affected beyond tolerable limits without strictly enforced mitigation measures. Many

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local people and those outside our state have expressed that we have some of the best protection measures in place presently in the United States, to the point that we are driving businesses away from Montana. In this instance, from our understanding and experience to date, it appears that we have a project proposed in our county that intends to maintain integrity within the local community on various fronts. Noranda has included mitigation measures in the event problems are encountered to make every effort to maintain compliance with our environmental laws. We would like to see them given the opportunity to prove the sincerity of their goals and objectives as set forth in their proposal with reasonable guidelines. We feel the social and economic benefits to our entire county will far outweigh the temporary impacts on the small portion of land affected by this proposed project, especially when you consider that when totaled less than one tenth of a percent of the land base of our county will be impacted! Yes, less than .001 of our land base in Lincoln County will be directly impacted by this project as identified in the DEIS.

Please review these thoughts as you prepare your Final Environmental Impact Statement with your decisions narrowed down to each alternative you will select for the various aspects of the Montanore Project. Thank you for the time and effort you invest in this process.

Sincerely,

Jim R. Morey
Jim R. Morey, Chairman

L. A. Dolezal
Lawrence A. (Larry) Dolezal

Noel Williams
Noel E. Williams

BCC:bjb

THE CONFEDERATED SALISH AND KOOTENAI TRIBES
OF THE FLATHEAD NATION
P. O. Box 278
Pablo, Montana 59855
(406) 675-2700
Fax (406) 675-2806

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Vern L. Clairmont · Executive Treasurer
Bernice Hewankorn · Sergeant-at Arms

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Lloyd Irvine
Patrick Lefthand
Henry "Hank" Baylor
Antoine "Tony" Incashola
John "Chris" Lozeau

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December 11, 1990

Ron Erickson
Kootenai National Forest
506 Highway 2 West
Libby, MT 59923

RE: Comments to Noranda Draft EIS.

Dear Mr. Erickson:

The Confederated Salish and Kootenai Tribes of the Flathead Nation submit the following comments on the Montanore Project draft environmental impact statement.

The Tribes have many concerns about the development of the Montanore Project and its potential effects on water quality and fisheries in the Kootenai Basin. The draft EIS document for this project was generally well done and readable-which is commendable. Our comments primarily address the issue of discharges from the impoundment area. The Tribes are particularly concerned about water quality issues because the proposed project area is within the aborginal territory of our Tribes. We have a treaty guaranteed hunting, gathering and fishing rights in the territory, which under no circumstances do we want diminished. The United State Forest Service has a fiduciary duty to protect and safeguard these treaty resources. Our technical comments on our water quality concerns follow:

The tone of the analysis in Chapter 4 on consequences to fish and aquatic life is very disturbing. The strong implication is made that the project may enhance aquatic life, which is based on misapplication of principles in the literature, contradictory statements, and misleading projections. In a project that has so much potential to cause environmental damage, even when managed effectively, such a tone does not contribute to constructive public involvement.

Three literature citations are given on page 204 to support the contention that fine sediment would improve fish spawning, increase invertebrate productivity, and stabilize substrate against intensive flows. These erroneous contentions are rightly contradicted earlier in the document when it is stated on page 119 that "most macroinvertebrates are considered intolerant of fine sediments...", and on page 203 where it is stated that "these intense flows restrict accumulations of smaller gravel and fine sediments...".

There is extensive literature on the deleterious effects of fine sediments on reproduction and survival of fish and macroinvertebrates. Libby Creek is not starved for suitable spawning gravels, but is limited by its high gradient and the absence of suitable energy breaks, such as instream debris, to capture and retain spawning gravel. The statement that seepage from the impoundment will augment streamflows and increase aquatic productivity clearly misleads the reader. Not only are those discharges of poorer quality than the receiving water, but the contribution to 10 year low flows after mining is completed is less than 2 percent.

The EIS predicts that discharges will increase concentrations of various metals in Libby Creek, but will only violate state water quality standards for limited time periods, or not at all. We believe mere compliance with these standards may not adequately protect all aquatic life, and should not guide decision-making when measures are readily available to maintain water quality at a level exceeding the standards. Regarding metals (such as copper), ambient concentrations may not be as important as total quantity discharged, since storage in sediments and accumulation in living tissues is a function of the absolute quantity available.

We are especially concerned that discharges from this mine not jeopardize the continued existence of the white sturgeon downstream in the Kootenai River. According to Apperson (1990), the sturgeon population present in the Kootenai River is threatened by the lack of juvenile recruitment, which may be the result of elevated copper concentrations. Her research has shown copper concentrations in Kootenai River water to range from 2 to 12 ug/kg, in sediments from 1.62 to 12.8 ug/g, and in sturgeon oocytes from 1.18 to 12.8 ug/g dry weight. In her report she states: "... concentrations of copper found in sturgeon oocytes potentially present the most severe contaminant effect on reproductive success", and "concentrations of copper in our oocyte samples were 100 to 250 times higher than those found lethal to larval white sturgeon". Therefore, every effort should be made to minimize discharges of copper and other contaminants to protect such species as the white sturgeon. The fact that discharges may meet water quality standards provides decision-makers with the false security that aquatic life is being protected.

It is our opinion that Noranda's proposal, Alternative 1, is unacceptable in light of the resources at risk and the availability of preferred options. Alternative 1 falls far short of a "good faith" effort to protect the environment both in its operational plan and its omission of important and proven remedial measures. In light of the resources at risk, the baseline objective should require that all mine and impoundment discharges be minimized to the maximum extent practicable. Because tailings water can be reused in the milling process, it is unreasonable to allow any recoverable water in the tailings impoundment to be released into the environment. Releases should only be an option when the process generates water excess to its needs, and then the releases should be of high quality. The plan proposes to use "clean" mine water as make-up water while simultaneously allowing contaminated tailings water to seep from the impoundment into the ground water. We feel this is a flawed plan, and thereby propose the remedial measures described in Alternative 3 as the only acceptable option (other than Alternative 7).

Since the options of clay or synthetic lining for the tailings impoundment were dismissed in the EIS, the only other acceptable means of minimizing seepage is the gravel drain system described on page 65. Since construction of this drain system is complicated and will perform to stated specifications only when installed correctly, we insist that there be adequate monitoring and quality control inspections before this option is employed.

The system of gravel drains to control seepage is only sensible if the recovered water is treated before discharge. The efficacy of the treatment techniques outlined is encouraging, and it would be unacceptable to fail to employ one of them. The wetlands method is desirable for its savings in electrical consumption (also an environmental impact) and the fact that it is self-regulating which would be a great asset during the timeless post-operational phase. Questions that must be answered about the wetlands option include: (1) What are risks of contamination to wildlife using the wetland, and (2) What is the ultimate fate of metals-saturated plants removed from the wetland.

We endorse the segregation of "clean" mine water (page 39) from process water as a necessary means of minimizing waste water problems at the impoundment site.

The failure to discuss the effects of reagents discharge in the draft EIS as mentioned on page 190 is a noticeable oversight, and serves to highlight the agency's inability to accurately analyze and predict the environmental consequences of this project. All practical technologies to protect the environment must be employed.

In summary, Alternative 1 is a short-cut approach without logical foundation. Mixing clean mine water with process water, utilizing pressure relief/seepage interception that captures 50 percent uncontaminated ground water and pumps it back into the impoundment only to re-seep, spray irrigation of contaminated water, and use of the impoundment as a water storage structure (page 39) are all contradictory and unreasonable measures that would unnecessarily result in surface water contamination.

We strongly urge that our concerns, and those submitted by others, particulary the Kootenai Tribe of Idaho, be fully addressed in your final environmental document.

Sincerely,
Confederated Salish & Kootenai Tribes

Michael T. Pablo, Chairman
Tribal Council

MTP/bh

ref: TF.BH.120690.NORANDA

Apperson, K.A., and Paul Anders. 1990. Kootenai River White Sturgeon Investigations and Experimental Culture. Annual progress report, funded by Bonneville Power Administration, Division of Fish and Wildlife, Portland, Oregon. Contract No. DE-A179-88BP93497.

U.S. Department of Transportation
Office of the Secretary of Transportation

400 Seventh St. S.W.
Washington, D.C. 20590

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DEC 12 1990

Recd
12/18/90
RWE

Mr. Ron Erickson
Kootenai National Forest
506 Highway 2 West
Libby MT 59923

Dear Mr. Erickson:

This office has reviewed the draft environmental impact statement for the Montanore Project proposed by the Noranda Minerals Corporation and the Montana Reserves Company. We have no comments.

Thank you for tha opportunity to review the draft EIS.

Sincerely,

Eugene L. Lehr
Eugene L. Lehr
Chief, Environmental Division

United States Department of the Interior
BUREAU OF MINES
SPOKANE RESEARCH CENTER
EAST 315 MONTGOMERY AVENUE
SPOKANE, WASHINGTON 99207-2291

TAKE PRIDE IN AMERICA

December 14, 1990

Mr. Ron Erickson
Kootenai National Forest
506 Highway 2 West
Libby, Montana 59923

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NWt

Dear Ron:

I have read through the Draft Environmental Impact Statement for the Montanore Project. I concentrated on the tailings disposal and backfill portions of the report since that is my area of expertise and have included a few comments for your consideration:

1. The Summary section, page S-7, described the tailings impoundment area of disturbance as 595 acres. However, in the body of the text, the disturbed area is listed at 729 acres (i.e., page 19). Why is there a discrepancy?

2. The plan for preparing the tailings impoundment foundation calls for placing 2 to 3 feet of compacted clay wherever sandy material is found. Considering this area is described as artesian, one would think that quite a bit of the underlying soils would need to be replaced with clay. Has a suitable clay source been found, and if so, has the environmental impacts been addressed?

3. The tailings embankment is designed as a downstream deposition method with cycloned sands used to build the structural perimeter. The method is very stable since a massive, free draining embankment is formed on the downstream portion of the tailings pond. However, this method requires extensive amounts of sands. I could not find a predicted mill tailings grain size gradation within the report. Will there be enough sands generated from the mill to construct this impoundment?

Thank you for the opportunity to review the draft EIS for the Montanore Project. If you have any questions, please do not hesitate to call me.

Sincerely,

Lani Boldt
Lani Boldt
Civil Engineer

United States Department of the Interior

TAKE PRIDE IN AMERICA

OFFICE OF THE SECRETARY
OFFICE OF ENVIRONMENTAL AFFAIRS
DENVER FEDERAL CENTER, BUILDING 56, ROOM 1018
P.O. BOX 25007 (D-108)
DENVER, COLORADO 80225-0007

January 3, 1991

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RCVD
JAN 7 1991

Mr. Ron Erickson
Kootenai National Forest
506 Highway 2 West
Libby, Montana 59923

Dear Mr. Erickson:

The Department of the Interior (DOI) has reviewed the draft environmental impact statement (DEIS) for the Montanore Mine Project, Kootenai National Forest, Montana and has the following comments.

Fish and Wildlife Resources

Some aspects of the proposal are not fully described. Throughout Chapter 2 there are phrases like "Noranda would develop written policies ...", " A comprehensive program would be developed ...", and "Noranda would develop a wetland mitigation plan ..." Without a description of what these policies, programs, and mitigation plans entail or require of the applicant, there is no way the impacts can be assessed. These descriptions, particularly of specific mitigation measures which will be implemented and included as stipulations to any approved permit, should be presented and analyzed in a supplemental DEIS or the final environmental impact statement (FEIS), and included as appendices to the EIS, as appropriate.

The environmental impacts of the proposal, especially those concerning wetlands and endangered species, are not adequately described. If Section 7 consultation had been completed prior to completion of the DEIS, a more complete description of impacts on endangered species would have been available. Likewise, if required Section 404 permits had been processed, needed information on impacts to wetlands would have been available. Therefore, we recommend that the FEIS not be released until after the biological assessment, the U.S. Fish and Wildlife Service's biological opinion, and the section 404 permit application have been prepared. Information in these documents relating to impacts to/mitigation for fish, wildlife and wetlands should be included in a supplemental DEIS or tha FEIS (with appropriate time allowed for public comment).

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Some impacts are omitted altogether. For example, to mitigate for impacts to grizzly bears, roads would be closed and the applicant would support changes to hunting licenses. The impacts on hunters that these actions would bring are not described. In addition, most of Chapter 4 is written with the verbs "could", "may", "should", and "might". Little is presented to indicate the probability of an impact occurring. The EIS should clearly present the impacts that are expected.

Page specific comments are enclosed.

Sincerely,

Robert F. Stewart
Robert F. Stewart
Regional Environmental Officer

Enclosure

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Specific Comments -- Montanore Minerals Corp. DEIS

Page 20 - The document states that, "the deposit has not been fully delineated and likely extends further north than the available drilling information indicates". It is then concluded that the mine will have a production life of 16 years. If the ore deposit is larger than described in the mine plan, it follows that the mine life is likely to be longer than 16 years and that its impacts will last longer than stated. We recommend that the EIS include an explanation of how impacts and mitigation beyond the 16-year period will be addressed.

Page 129 - The woodland caribou is not listed as an endangered species in Montana by the U.S. Fish and Wildlife Service.

Page 134 - The acreage, locations, and classification of wetlands are mostly absent and are deferred to the Section 404 permit stage. Wetlands should be described fully in the EIS and their locations shown on maps. Actions planned to mitigate wetland losses should also be described.

Page 145 - The hunting of species other than elk should be discussed and analyzed.

Page 187 - It is stated in the fourth paragraph that ". . . Noranda proposes to intercept 195 gpm of impoundment seepage to prevent exceeding surface water standards". Because "proposing" to intercept carries no obligation to do so, we recommend that "proposing" be changed to "commits" or "will be required to".

Page 203 and 205 - Paragraph two on page 203 states that "Not much is known about the effects of increased metals concentrations on organisms inhabiting very soft waters, such as in the Libby Creek drainage". It also states that "Noranda's proposed discharge would increase metals concentrations in Libby and Ramsey Creeks". On page 205, paragraph two, we read "The projected increases in dissolved concentrations of heavy metals accompanying the Montanore Project would increase the potential for risk and future impact to these fish". Studies should be required to assess how fish in soft waters are impacted by the concentration of metals expected and appropriate stipulations included in any permits to halt work should these studies indicate such a need.

Page 207 - The first paragraph under "Alternative 1" states that wildlife would be displaced to other areas. Unless there are unoccupied suitable habitats nearby (a rare occurrence), such displacement results in either population reductions or habitat degradation through overuse. The fate of the displaced animals and the impacts to these "other areas" should be fully described.

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Page 210 - The first paragraph explains that line construction, including blasting, could occur during the winter and displace wintering big game animals. The EIS should state what will occur, not what could occur. One cannot quantify impacts on what could happen. If power lines are to be constructed during the winter, the EIS should explain why it cannot be done during the summer.

In the fifth paragraph, the assertion that big game "might be" affected by increased hunting and road use is an understatement. The question is not if they will be affected but how much. Obviously the magnitude of the impacts will depend upon how much the hunting and recreational road use increases. The EIS should present such information and make a reasonable attempt to quantify the impacts.

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
215 NORTH 17TH STREET
OMAHA, NEBRASKA 68102-4978

January 25, 1991

REPLY TO
ATTENTION OF
Planning Division

Mr. Ron Erickson
Kootenai National Forest
506 Highway 2 West
Libby, Montana 59923

Dear Mr. Erickson:

I hope you can use these comments even though they arrive late. We have reviewed the Montanore Project Draft EIS, Lincoln County, Montana, and we offer the following comments.

Federal Flood Plain Management criterion basically states that construction which can be damaged by flood waters or which can obstruct flood flows should not be located in the 100-year flood plain. If this is not practicable, any residential construction which can be damaged by flood water should be placed above the 100-year flood water surface elevation and nonresidential construction which can be damaged by flood water should be placed above or flood-proofed to above the 100-year flood water surface elevation and should be designed to minimize potential harm to or within the flood plain. If the operation of the constructed facilities is considered critical during flood periods, the facilities should be protected from the 500-year flood. Flood plain construction should not increase the water surface elevation of the 100-year flood more than one foot relative to existing conditions.

The proposed powerline construction crosses the flood plains of small drainageways and streams. Flood-related problems should not occur if the supporting structures for overhead powerlines are located as far from the banks of the drainageways and streams as possible to minimize the potential for erosion hazards and floodflow obstruction. Similarly, flood-related problems should not occur with underground powerlines if the lines are buried far enough below the beds of drainageways and streams to prevent exposure due to streambed erosion during periods of high floodflows and if any above-ground construction subject to flood damage, such as electrical boxes, is either placed above or flood-proofed to above at least the 100-year flood elevation.

It appears that some of the construction could take place in waterways or wetlands which are classified as waters of the United States and are, therefore, regulated under Section 404 of

the Clean Water Act. If construction activities involve the temporary or permanent placement of dredged or fill material into waterways of the United States, a Section 404 permit may be required. For a detailed review of the permit requirements, final project plans should be sent to:

Mr. Robert McInerney
U.S. Army Corps of Engineers
c/o DNRC/CDD
1520 East 6th Avenue
Helena, Montana 59620-2301

If you have any questions, please contact Mr. Steve Rothe of our staff at 402-221-4579. Thank you for the opportunity to review this proposal.

Sincerely,

Gerard E. Mick

Gerard E. Mick, Chief
Environmental Analysis Branch
Planning Division

IDAHO DEPARTMENT OF HEALTH AND WELFARE
DIVISION OF ENVIRONMENTAL QUALITY
2110 Ironwood Parkway, Coeur d'Alene ID 83814 2648 (208) 667 3524
Cecil D. Andrus Governor   Richard P. Donovan Director

INPUT NUMBER	TYPE	NRO	SIG.	AREA	STATE
192	L	\	1	N	ID

December 2, 1991

Bob Thompson
Kootenai National Forest
506 Highway 2 West
Libby, MT 59923

Re: Montanore DEIS and Supplemental DEIS

Dear Mr. Thompson,

We have reviewed the subject documents. They are, in general, thorough and among the better such documents reviewed by this office. As an interested downstream party, however, we are concerned that some issues have been omitted from discussion, and some impacts have been underestimated.

The Kootenai River in Idaho has been designated as a Special Resource Water. It is maintained for all beneficial uses except salmonid spawning, which is reserved for future use. Designation as a Special Resource Water recognizes at least one of the following characteristics:

a. The water is of outstandingly high quality, exceeding both the criteria for primary contact recreation and cold water biota; or

b. The water is of unique ecological significance; or

c. The water possesses outstanding recreational or aesthetic qualities; or

d. Intensive protection of the quality of the water is in the paramount interest of the people of Idaho; or

e. The water is a part of the National Wild and Scenic River System, is within a State or National Park or wildlife refuge and is of prime or major importance to that park or refuge.

f. Intensive protection of the quality of the water is necessary to maintain an existing, but jeopardized beneficial use.

The Kootenai River is already being impacted to the point that existing beneficial uses are jeopardized. Sedimentation from dam operation, as well as historic timber and mining activities upstream have significantly degraded water quality.

Our comments on the documents are as follows:

1) Sediment is addressed in the DEIS and Supplement. The DEIS maintains that since the Libby Creek watershed receives seasonal flushing flows, fine sediments will not be deposited and hence will not affect beneficial uses. Even if other projects are begun in the Libby Creek watershed, due to the hydrology of the system, cumulative effects are not anticipated. We feel this is an underestimation of the effects of sedimentation and narrow view of cumulative effects. The reality is that the fine sediments will be washed into the Kootenai River, where they will likely impact beneficial uses, especially when considered as a part of the cumulative effects of the Kootenai River basin.

BMPs are prescribed in all transmission line options. Our experience has been that they are not initially installed in sufficient quantity or installed appropriately for the type of drainage. Using a reiterative review process, the BMPs are typically in place at the end of the project at a level they should have been at the beginning of the project. Meanwhile, erosion and sedimentation continue. The generalized erosion control plan submitted in the Supplemental DEIS is a good start, however, we suggest that through development and use of a detailed site-specific erosion control plan developed by a knowledgeable party, sediment effects from the project can be reduced to a minimum. A monitoring plan should be adopted to document the effectiveness of the plan, and modifications to improve sediment control can be made.

2) Acid rock drainage (ARD) is also addressed several times in both documents. It appears ARD is not likely to occur on a large scale, except from certain areas of the mine such as the barren (lead) zone. It also appears that under most conditions, no discharge of metals from the percolation ponds or tailings pond will violate Montana water quality standards, especially under Alternative 2. We suggest that due to the uncertainty in the ARD analysis and limited treatment options available once ARD starts, additional consideration be given to Alternative 3, construction of a treatment plant. Construction of a treatment plant offers the advantage of providing continuous high quality discharge, ideally below background. Even though the discharge may be below standards under Alternative 2, prevention of additional load on downstream water bodies is beneficial. Treatment plants can react to changes in discharge water quality more quickly than passive systems, hence provide additional protection against accidental discharge. Treatment plants can be modified when influent water quality changes are encountered. Alternative 3 is expensive, however, should a plant be necessary for post mining discharges, construction will undoubtedly be cheaper if built with 1992 dollars.

Reclamation bonds collected by Montana agencies should be sufficient to construct and operate a treatment system if the applicant becomes insolvent or otherwise cannot control ARD.

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3) An issue not addressed in either document is that of catastrophic discharge to the watershed. It has been our experience that over the projected life of the mine, several catastrophic discharges can be anticipated. These events are usually short in duration, but can contribute a substantial load to the system. For example, the location of the haul road adjacent to Libby Creek represents a high potential for discharge of concentrates in event of a vehicle accident. Dismissing such events as insignificant due to their infrequent nature is inappropriate. The effects of one such event may last many years and contribute significant load to downstream water bodies.

We support consideration of additional Alternatives that take steps to prevent water quality problems associated with the project, rather than those that rely on mitigation and clean-up at a later date. Measures to prevent discharge of sediment and metals to the Kootenai River watershed, however small those discharges may be, are appropriate, given the status of the Kootenai River in Idaho.

Sincerely,

Brian Cochrane
Water Quality Compliance Officer

c: Ed Tulloch, IDHW-DEQ, WQ Field Supervisor

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MONTANA STATE SENATE

SENATOR ELEANOR L. VAUGHN
SENATE DISTRICT 1
HOME ADDRESS
P.O. BOX 45
LIBBY, MONTANA 59923

COMMITTEES
STATE ADMINISTRATION
CHAIRMAN
LOCAL GOVERNMENT
VICE CHAIRMAN
FINANCE — CLAIMS

CAPITOL STATION
HELENA, MONTANA 59620
PHONE (406) 444-4800
HOME PHONE (406) 293-5431

RCVD
DEC 12 1991
Kootenai National Forest
Libby, Montana

December 9. 1991

MONTANORE SUPPLEMENTAL HEARING:

I am very concerned about the economy of our area and when we are in an area that is as depressed as we are right now, it is devistating to the area to find first one obstacle after the other in the way of progress. Montanore Project is the one bright spot we felt we might have in Lincoln County for the future.

We are all concerned about the clean water and air in our area but is it possible that these things could be better dealt with in an original EIS so there won't have to be so many supplements and companies will know from the beginning just what they have to do? We all need to work together and to have the information the companies need completely so they know where they can and cannot operate and that the companies be sure they furnish all the information needed for their operation.

We have heard all about the grizzly habitat and other wildlife effected by mining, logging etc and yet the wildlife in the Troy-Asarco Area have survived very well and can be seen in all areas. We need to look at the needs of the area for survival as well as the wildlife habitat and try to reach a happy medium.

There seems to be a lot of conflict about the placement of the transmission line. It seems the view of the transmission line won't be that much above the tree line and can be established without any permanent wildlife habitat disruption;.

Is it possible a waiver could be issued to allow for continued operation and work on a solution for the problem of discharge into Libby Creek rather than halt progress completely?

Since most of Montana depends on natural resources for existance from mining, logging and agriculture we must work hard to have the issues clearly understood so businesses can and will operate in Montana and be able to protect our clean water and clear air.

Jobs is what we need, jobs that put people above the poverty level and have jobs that pay wages so people will be able to survive and be tax paying citizens.

Lets work deligently together to accomplish these goals.

Eleanor L. Vaughn
Senator Eleanor L. Vaughn

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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
215 NORTH 17TH STREET
OMAHA, NEBRASKA 68102-4978

REPLY TO
ATTENTION OF

December 19, 1991

INPUT NUMBER	TYPE	WHO	SIG.	AREA	STATE
225 ~~155~~	L	G	I	N	NE

Bob Thompson
U.S. Forest Service
Kootenai National Forest
506 Highway 2 West
Libby, MT 59923

Dear Mr. Thompson:

This letter is in response to your request for comment on the Supplemental Draft Environmental Impact Statement for the construction and operation of the Montanore Project. Our comments are as follows.

a. The Corps concurs that the preferred alternative to be utilized be Mine Alternative #2, which is the "Agencies" preferred alternative. Within that alternative we would suggest that the surface water issue under Alternative 2 be modified to include water treatment as a safety factor, only in the event that actual future water quality does not meet predicted quality. We would also suggest that reconstruction of the Great Northern Mountain Trail under Alternative 2 be modified or even deleted, if any proposed use plan should increase human activity which would negatively impact black bear habitat and/or populations.

b. Human intrusion is recognized by everyone as the factor which has imperiled the existence of the grizzly bear within the Cabinet Mountain Wilderness Area/Kootenai National Forest. Therefore, after mine reclamation, we would suggest that all Noranda properties be retained by Noranda or, transferred or sold only to agencies/conservation groups which would manage the properties in the best interest of the bears. Because the current intrusion factors will only worsen with the advent of obvious future increased human use of the Forest, the Corps would also suggest that the Kootenai National Forest expedite all grizzly bear management plans. The Corps would therefore support any and all options which would help safeguard our wildlife legacy.

c. Page 65 implies that because the wetlands are small and not fed by significant drainage basins that the value of their functions to the region is limited. The Corps suspects that the writer of this section may not appreciate the functions of wetlands and therefore does not perceive their value. There are many such small wetlands throughout the Kootenai National Forest. These wetlands whether fed by significant drainage basins or not is immaterial. What is significant is that these small wetlands are

responsible for a great deal of biodiversity, and because they are such fertile ecosystems, they are able to produce much more biomass acre for acre than any other ecosystem in the Forest. It is this biomass produced, whether plant, invertebrate or vertebrate, that makes these wetlands "grocery stores", from which most creatures of the forest can directly or ultimately derive benefit.

d. Please recognize that there is considerable disagreement between the political and the scientific communities as to the protection which needs to be afforded wetlands. Please also recognize that the scientific community bases their wetlands delineation on a scientific basis and the political community bases theirs on politics. We at the Corps anticipate future revisions to current wetlands policy.

Thank you for the opportunity to comment on the Montanore Project.

Sincerely,

Richard D. Gorton

Richard D. Gorton
Chief, Environmental Analysis
Branch
Planning Division

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII, MONTANA OFFICE
FEDERAL BUILDING, 301 S. PARK, DRAWER 10096
HELENA, MONTANA 59626-0096

Ref: 8MO

December 23, 1991

INPUT NUMBER	TYPE	WHO	SIG.	AREA	STATE
229 ~~55~~	L	G	I	R	mt

Robert L. Schrenk
Forest Supervisor
Kootenai National Forest
506 Highway 2 West
Libby, Montana 59923

Re: Supplemental Draft Environmental Impact Statement: Montanore Project, Noranda Minerals, Corp., Kootenai National Forest, Montana

Dear Mr. Schrenk:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, Region VIII of the Environmental Protection Agency (EPA) has reviewed the Supplemental Draft Environmental Impact Statement (SDEIS) for the Montanore Project. The EPA has attached Detailed Comments for your review and consideration during the preparation of the Final Environmental Impact Statement (FEIS).

This document was generated in response to a number of serious concerns and objections elicited by the original Draft EIS (DEIS) in October 1990. The Forest Service has accomplished a formidable task in addressing those concerns and in adjusting this document to incorporate current information.

The Forest Service has selected Alternative 2 for the construction of the mine, mill, tailings pond, percolation sites and access roads. Alternative 5 was chosen as the preferred transmission line alternative. Additional analysis and information important to the EPA was provided in this document concerning subsidence, tailings impoundment stability, water quality, surface and ground water hydrology, wetlands, and fish/aquatic life.

The EPA Region VIII rates this document EC-2. This rating reflects environmental concerns relating to actions proposed in this document and those raised in the original Draft EIS which are still unresolved. A rating summary sheet has been enclosed for your re-review.

The EPA commends the Forest Service for its efforts in producing a far better document. We very much appreciate your full attention to our concerns and very professional manner of responding and cooperating with us on this particular project. The EPA looks forward to working with the Forest Service, on an early-on basis, to address impacts from future mining proposals.

If the Forest Service has any questions regarding this review, please feel free to contact either myself or Jeff Bryan of my staff at commercial (406) 449-5486, or FTS 585-5486.

Sincerely,

John F. Wardell

John F. Wardell, Director
Montana Office

Enclosure

cc: Phyllis Williams, 8WM-EA
Dawn Roberts, OFA-A104
James J. Scherer, 8A
Max H. Dodson, 8WM
Bob DeSpain, 8WM-EA
Gene Reetz, 8WM-SP
Rob Walline, 8WM
Dave Powers, OFA-A104
John M. Hughes, USFS
Dennis Casey, MDSL
Dennis Iverson, MDHES
Karen Barclay, MDNRC

U.S. ENVIRONMENTAL PROTECTION AGENCY
MONTANORE PROJECT
SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT
DETAILED REVIEW COMMENTS

SPECIAL AQUATIC SITES:

The EPA was concerned that the proposed wetlands/fisheries mitigation plan was apparently developed without significant input and coordination with the Montana Department of Fish, Wildlife and Parks (MDFWP), Kalispell Regional Office and the U. S. Fish and Wildlife Service. These agencies have the biological and ecological technical expertise for wetlands and fisheries mitigation issues, and also have staff in the Montanore geographic area, and should be involved in planning and development of wetlands and fisheries mitigation projects.

The EPA feels the objectives of the proposed wetland mitigation plan are good (e.g., replacement of lost wetland functions and values on a one to one basis, mitigation concurrent with wetland loss, establishment of a monitoring plan, etc.). Additional specific wetlands mitigation information should be included in the Final EIS. This will better verify that the functions and values of the lost and impacted wetlands will in fact be replaced.

The proposed tailings impoundment and diversion channel will result in the loss of 5,500 feet of stream habitat in Little Cherry Creek and Libby Creek. It does not appear to the EPA that improving spawning habitat in Howard Creek and introducing rainbow or cutthroat trout into Midas Creek will adequately mitigate these fishery and stream habitat losses. According to MDFWP officials, the Howard Lake-Howard Creek fishery already has a self-sustaining fish population, and it is not clear if improving spawning habitat in the creek will result in much overall fisheries improvement. Also, the fish passage problem in Midas Creek, alluded to on page 118 of the Supplemental DEIS, should be discussed further in relation to the probable success of fisheries mitigation in Midas Creek. THe EPA feels strongly that Noranda should work closely with the Kalispell Regional MDFWP fisheries staff to develop an improved fisheries mitigation plan.

It is also unclear to the EPA why fisheries habitat components cannot be better incorporated into the diversion channel design. Why must the diversion channel bypass flows around the lower segment of Little Cherry Creek and a segment of Libby Creek, significantly reducing water flows in these segments? The EPA also asks for an expanded discussion of channel capacity and stability in the unnamed drainage of Libby Creek into which Little Cherry Creek diversion flows will be directed.

WATER QUALITY:

The EPA remains very concerned over the basic issue that water quality standards are likely to be violated under the preferred alternative/alternatives. "The agencies' analysis predicts that surface water quality standards could be violated during years 2 to 3 of the construction period and throughout mine operations" (Summary page 7). And, "The agencies used assumptions that are reasonable, conservative, and protective of water quality" (Summary page 7).

The EPA does feel that concerns over the adequacy of existing baseline information has been partially resolved. A commitment to lower detection limits, additional parameters and additional data is good. However, there is still not sufficient data at the appropriate detection limits to provide an adequate baseline for impact analysis.

The EPA generally agrees with the goals of the monitoring programs, however we are concerned about the implementation of these goals (page 181). The following are examples of these concerns related to the stated goals.

- Whether an impact is "measurable" depends on the experimental design, which takes into account the expected variability of the data. The monitoring design should be to meet a stated level of accuracy and precision - each separately and independently.
- In order to determine whether "alterations" or "additional mitigation" is required there must be specific criteria of effect, and these must relate to the experimental design of the monitoring.
- Specific questions regarding specific stream reaches and specific parameters must be stated in order to determine whether the monitoring program is capable of meeting its goals.

The EPA asks how will a resolution be made if one of the agencies feels an impact is shown but others do not (pages 181 & 182)? Since the public has shown a strong interest in this project and its potential effects, specifically how will the public be invited to participate in these reviews and how will public participation be encouraged? What criteria will be used to support the "finding" that pollution of surface or ground waters have or will occur and what criteria will be used for biological effects?

The stating that "various performance standards" or "specific permit conditions" would "document compliance of operations" does not allow a specific assessment of potential

effects without specifying what these conditions or standards are (page 182). What is specifically meant by "appropriate corrective actions"? The EPA suggests that the end results, which is that the impact is eliminated or mitigated for, be used in this language and that this language be in the permit requirements. Since there are presently not specific standards for aquatic life, it is essential that specific criteria of effect be a part of the permit.

The EPA is pleased that whole effluent toxicity testing of ambient and mine-related waters is proposed, however there are a number of concerns that need to be considered in the WET testing (page 195).

- Pre- and post-operational monitoring - water for testing should be collected when the concentrations of potentially toxic materials are highest. This may or may not be in August.
- Appropriate ambient and dilution waters at all times are those waters uninfluenced by any mining activity.
- There is more recent EPA guidance on toxicity testing than the referenced 1985 document. We recommend these be used.
- Both acute and chronic testing should be part of the testing: 48 hours for ceriodaphnia (reproductive success endpoint) and 7-day for fish (growth). The percent of organisms affected should be the LOEL as a criteria for further studies.
- The EPA has concerns about working with early life stages of trout alone, since the most sensitive stages to metal toxicity may be at stages when any handling causes mortality. We recommend that fathead minnows of known age be used in addition to the trout. We recognize the concerns over low ionic waters on the test species and suggest that a meeting be held with our bioassay personnel to work out an acceptable protocol.
- All factors of specific test procedures, parameters, criteria of affect, and levels at which some action will be taken should be spelled out and approved in advance. A rigorous QA/QC program should be a part of the testing.
- The EPA feels it is not satisfactory to omit further testing "after a satisfactory relationship has been defined". There is no assurance that holding pond and mine waste pond water will not change during the life

of the project. In particular, the use of forced evaporation may well increase concentrations over time, and the mine water itself may change as different strata and water sources are encountered.

The EPA raises concern about potential effects on threatened and endangered or otherwise uncommon or sensitive fish species and their populations. Since the torrent sculpin is listed as imperiled by the Montana Natural Heritage Program and sensitive by the Kootenai National Forest, what special measures are being taken to protect these fish? What is the size of their populations in affected streams? Since this species is known only from the Kootenai Forest and given its status, saying this species is "relatively abundant in many of these streams", appears inadequate. Where is the data this is based upon? What constitutes "relatively abundant"? What particular sensitivities to water quality and habitat alteration do these fish have that other species may not?

The EPA feels the documents proposed detection limits for metals are unacceptably high for several parameters. Detection limits should be as low as possible given current technology in a competent lab. This is necessary to evaluate the magnitude of change from existing levels that are presently lower than standards (for antidegradation purposes), to ensure numeric water quality standards are met in the future, and to provide an accurate basis for mass balance analysis for predicted versus measured water quality changes.

The proposed detection limits for the following parameters (see Table 1, enclosed) are unacceptably high because they either (*) are above State standards at a hardness of 20, or (**) do not allow the quantitative calculation of effects on nondegradation, or (***) both of the reasons. Attainable detection limits are based on those reported for the ICP-MS method in an EPA Workshop on Metal Contamination in Surface Waters/Methods for Assessment and Control, December 1988.

The EPA has examined Table 6-7(R) very closely. This table reveals 34 values that are suspect and unusable. Apparently similar analytical errors were made in both 1989 and 1990, casting doubt on the Quality Assurance/Quality Control (QA/AC) procedures at some point in the process. The chromium level detection limits is higher than State standards as is lead and silver. The result is almost no data on key parameters for assessing future compliance with numeric standards or nondegradation. This includes zinc, silver, copper, lead, and chromium. Samples with lower detection limits for two of these parameters are provided on Table 6-9(R). Lead detection limits still exceed the standards and lead is at the standard. This small amount of data does not make up for the 1989 and 1990 data that is of little value. Actual flows are not given for either of the tables, and even the time of year of sampling is not presented in Table 6-9. If sampling was done in May, this is not likely to be a low flow period.

The EPA has also examined Table 6-11(R) percolation pond water quality. We find that total recoverable values exceed existing State standards for several parameters for at least one of the three sample periods. Although the text on page 162 implies that there may be considerable sediments associated with the samples, there is no data to validate this, and in fact, the total recoverable may be similar to the dissolved. The EPA suggests that total recoverable may indeed be the proper value since there is no surety of soil filtration capacity over the long run and existing instream data show violation of stream standards in Libby Creek. In addition, many of the detection limits will not allow determination of numeric standard violation or calculation of the reduction of quality from existing to impacted condition.

The EPA, given the poor evidence of QA/QC shown in Chapter 6 water quality tables, the loss of approximately 14 percent of the benthic samples in the WESTECH 1990 monitoring report, and the inappropriate sampling of only dissolved metals in 1988-89 data, doubts the trustworthiness of the QA/QC program!

Air Quality:

Except for a discussion on data reporting (pages 197 & 198), the EPA could find no response to our questions and concerns in the SDEIS regarding those specifics outlined in our original comments of December 28, 1990. The EPA would highly recommend a review of those comments and discussion with us for appropriate inclusion into the Final Environmental Impact Statement.

TABLE 1

COMPARISON OF DETECTION LIMITS AND STANDARDS

Noranda Proposed	Attainable Detection Limits		Table 4-10 Montana W.Q. Standards	
Cd-0.1	.07		0.3	
Cr-20	.02	**	11.	*
Cu-1	.03	**	3.	
Pb-1	.05	**	0.4	*
Mn-20	.04	**	50.	
Hg-0.2	0.1	**	.012	*
Ag-0.2	.04	**	0.12	*
Zn-20	.08	**	27.	

SUMMARY OF RATING DEFINITIONS

ENVIRONMENTAL IMPACT OF THE ACTION

LO--LACK OF OBJECTIONS

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC--ENVIRONMENTAL CONCERNS

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO--ENVIRONMENTAL OBJECTIONS

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU--ENVIRONMENTALLY UNSATISFACTORY

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

ADEQUACY OF THE IMPACT STATEMENT

CATEGORY 1--ADEQUATE

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

CATEGORY 2--INSUFFICIENT INFORMATION

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

CATEGORY 3--INADEQUATE

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From: EPA Manual 1640, "Policy and Procedures for the Review of Federal Impacting the Environment."

1645

INPUT NUMBER	TITL	[illegible]	SIG.	[illegible]	[illegible]
232	1	C	3	1	MT

BOARD OF COUNTY COMMISSIONERS
LINCOLN COUNTY
STATE OF MONTANA

DISTRICT NO 1, LIBBY
GERALD R. CRINER

DISTRICT NO 2, TROY
LAWRENCE A. (LARRY) DOLEZAL

DISTRICT NO 3, EUREKA
NOEL E. WILLIAMS

CLERK OF THE BOARD AND COUNTY RECORDER CORAL M. CUMMINGS
512 CALIFORNIA AVENUE
LIBBY, MONTANA 59923

RCVD
DEC 23 1991
Kootenai National Forest
Libby, Montana
59923

December 20, 1991

Bob Thompson
Kootenai National Forest
502 Highway 2 West
Libby, MT 59923

RE: Noranda EIS

Dear Mr. Thompson:

We respectfully submit this written testimony on the review of the DEIS and supplement that are being conducted on the Montanore Project. We are faced with one primary question on how the Montanore Project will impact Lincoln County. Can we permit certain altering impacts on a minute portion of our land area to gain the overall socio-economic benefits that it will provide to our very threatened and endangered social community structure? Would this be a reasonable trade-off?

As we address the various issues, let us point out that the conclusion we have reached is clearly affirmative. We are all concerned about our quality of life. That is one primary reason we have all chosen to live here. We must endeavor to make an objective analysis of the impacts, positive or negative, in light of the total overall picture. We must guard against putting on blinders that would block out this large picture as we focus in on the specific areas that will encompass the Montanore Project.

ISSUES:

General Forest Activities

There is one background factor that must be continually kept in mind in order to maintain a proper perspective on how the Montanore project will impact Lincoln County. According to the EIS documents, 1,272 acres are identified to embrace temporary disturbance as a result of the activities of the project. This would be less than .001 of our land base. As we evaluate the impacts, we need to remember that the surface land area encompassed by the Montanore Project will be less than one tenth of one percent of the entire land base of both Lincoln County and the Kootenai National Forest. This minute portion of Lincoln County is undergoing microscopic scrutiny as the Montanore Project is subjected to a fine-toothed combing analysis.

There may be some temporary displacement of recreational opportunity and use in the three drainages identified (Libby, Ramsey and Poorman). However, we must remember there are virtually hundreds of drainages on the Kootenai National Forest within Lincoln County that offer similar recreational opportunities and uses that will be able to offset this temporary disruption.

On the one hand we identify displacement of recreational opportunity and use in some areas, and yet on the other hand we identify there will be increased opportunity and use in adjacent areas (Howard Lake campground and Libby Creek Recreation Gold Panning Area). Is it really fair to expect the developers to pay for dislacement in one area and at the same time pay for increased use in another area? Or do these situations merely offset one another?

If a reasonable, conscientious effort were made it seems that the management of open and closed roads within the project area can be fit into the overall road management of the forest system within the surrounding area without unnecessarily burdening this project with excessive, unjustifiable, and costly mitigation measures.

Other Forest Uses:

The improved road will provide safer access into these areas for a variety of motorized recreational opportunities. The added turnouts for safer viewing would be a real asset.

Wildlife Population and Habitat:

Again it seems reasonable that there is adequate room in surrounding forest areas that would more than sufficiently handle the temporary displacement of big game and other wildlife species without requiring potentially excessive special mitigation measures. We would like to point out that the end result of the Troy Unit of ASARCO on wildlife was essentially a modified game preserve that increased forage and control measures that benefitted game animals. This did not cause temporary displacement, but rather, in this instance, it created a temporary harboring place of enhanced habitat. Could the same result be anticipated here?

Threatened and Endangered Species:

Having served on the local advisory committee for grizzly bear management since the onset, and again trying to apply a practical and reasonable approach to common sense measures, it does not appear to us that the wildlife biologists have scientifically and

categorically proven that there is a real problem here with temporary displacement of grizzly bears and an increased mortality risk. Again we must say that the bear is provided with more than adequate habitat in surrounding areas. We are not forcing bears that **may** be displaced to compete with other bears elsewhere in adjoining drainages. According to the findings of the local study efforts available to us, it appears that the adjoining drainages hold, if any, a minimal population of grizzly bear.

We have a real problem with the idea of habitat loss. At worst, this is temporary displacement. At best, this very well could be temporary enhancement as pointed out previously. There is no need to significantly alter land ownerships. There is adequate available habitat for grizzly bear on the Kootenai National Forest. The grizzly bear is not crowded for space. The agencies have estimated only 15 live in the Cabinets. There surely is ample room for them to utilize other existing habitat without setting aside more. It is unreasonable to impose unwarranted mitigation measures for these threatened and endangered situations. There just is not a sufficient population of grizzlies to warrant these excessive measures. When are we going to start to incorporate a little common sense in dealing with these controversial issues?

Consider the grasses and clover planted on the disturbed areas of ASARCO's Troy Unit. These areas have proven to be frequented by black bear. It developed into a game refuge for them, being posted "No Hunting". We are not aware of an increase of enforcement problems here. Have these factors been considered as they also may relate to grizzly bear?

Roughly 75% of Lincoln County is publicly owned land managed by the Forest Service and other agencies. Approximately 14% of Lincoln County is managed primarily for timber by large corporate interests, leaving only about 11% of our land base held and managed by individuals, families and small companies. As you can see, we have a very limited private land tax base. We do not need to further complicate this with over-zealous land acquisitions that are unnecessary when one keeps the total picture in proper perspective. These habitat units in question will be available for future use. Who can unequivicably state that these habitat units won't be utilized in some manner during the life of this project as has occured near Troy? Possibly by the time the project has run its life and the area is reclaimed there may be some augmented grizzly bear that also might utilize the area. However, they already have plenty of habitat opportunities currently available to them.

One very real question that we have heard many times asks if the grizzly bear is a convenient legal way of perpetuating positions in a field of training into which many have invested years and dollars. Is our real concern the grizzly bear, or are

we perpetuating wildlife biologists under the guise of this threatened and endangered recovery and augmentation program?

We know some of these biologists. We do not intend to devalue their training and the investment they have made. However, this is a question that seems to weigh heavily on the minds of many people. We must carefully consider the **public relation** portion of this grizzly bear mitigation. If the people are pushed too far, there will more likely be revolt rather than cooperation. Then everybody loses, and all the efforts to help the bear would have been in vain. From the public pulse with which we are in contact, we sense we are fast approaching the breaking point where many are precipitously close to throwing in the towel in our community efforts to work with this program. Once lost, this cooperation would be virtually impossible to regain. Why do we need two more biologists just for the area encompassed by the Montanore Project? How many grizzly bear may be impacted that require this protection? What precedent is used to justify this? There apparently has not been such a need for additional personnel to manage bears on the ASARCO Troy Unit. This seems to establish quite a different precedent. Is there a need for these positions to supplement the informational and educational efforts that are already currently being pursued? Are we not possibly overdoing this? We are sure we are already the most informed and educated general populace on grizzly bears.

Water Resources:

We all want to protect our water quality and our quality of life. From the information we have researched there is a reasonable limit within which the water composition can be altered and still provide a viable life cycle for plants, insects and fish, while also staying well within safe drinking water standards for wildlife and human consumption. We are currently experiencing a legal technicality of non-compliance with the exploration permit over a function of their operations that poses no real threat. We most certainly do not advocate releasing toxic substances into our waters. The apparent intent of our water quality laws was to prevent just such a thing. However, there must be some flexibility built into the laws and the procedures that provide allowances for **objective** standards when substances introduced into our waters within acceptable levels provide enhancement of the life cycle in the stream rather than degradation of the stream when applied to the strict definition on paper. Again, we seem to be throwing common sense out the window here. There should be a reasonable and timely solution to this problem.

Cabinet Mountains Wilderness:

There are many places that provide opportunity for solitude and primitive recreation within the Cabinets, and these will adequately provide for wilderness use during the life of the

project. You can already see Libby and Troy, Noxon and Trout Creek, Asarco and farm and ranch lands from various points on top of the Cabinets. Why is this viewing impact such a big deal? The existing wilderness within the Cabinet Mountains is known to be a narrow corridor. We can not change that within the scope of this project. In many ways this already compromises the natural integrity and apparent naturalness of this area. There are limited opportunities to get the same experience in the Cabinets as you can by escaping into the vastness of the Bob Marshall Wilderness. At just about any point along the Cabinets one could hike up and down from one side to the other in the same day.

Again, let's be realistic when we evaluate these things. You can already hear the train, traffic on the highways, cows and dogs and even people talking or hammering from many vantage points in the Cabinets. Are we going to make these sources all reduce their noise levels, or can we simply choose to avoid those peaks if that sort of thing is bothersome to us?

Tailing Impoundment Stability:

It appears to us that you have adequately addressed any potential problems here, and that properly designed systems can be modified to control the potential problems anticipated.

Socio Economics:

Again, keeping the total picture in mind, we easily conclude that we can retain our quality of life and water and environment with some concessions for impacts on less than one tenth of one percent of our land base within Lincoln County when we consider the socio-economic impacts of this project.

This project is quite possibly the one bright spot on the horizon for our community. We have had permanent and temporary lay-offs due to curtailments and shut-downs in both mining and timber within our communities for a variety of reasons. Our tax base is declining which threatens to put a greater tax burden on the residential home owner to maintain and support the services to which we've grown accustomed that are provided to our communities through the schools, the federal and state agencies and the county and city governments. This project can provide us the opportunity to "hold our own" while we embrace the pending transitions in our local economy. The jobs created by this project will benefit many local families and provide a very welcome and needed boost to basic industry income within our communities, along with the indirect service industry income that follows.

The increased tax revenues generated by this project will pay for the increased costs of servicing these residents through the Hard Rock Mining Impact Plan process. Basic industry wages from about 450 new jobs provide approximately a turnover of seven times in the local economy, while service industry wages from about 200 new jobs are estimated to provide less than half of that turnover. You can see the value of those basic industry positions to our local economy. These positions will hopefully provide employment for many of our residents who have been adversely affected by the downturn previously mentioned in timber and mining. This would help stabilize our declining tax base and possibly provide some marginal recovery for our local economy.

CONCLUSION:

We must carefully weigh and balance all of the competing factors. There must be a reasonable solution that will allow the Montanore Project to proceed in a timely manner and yet not include excessively burdensome bureaucratic mandates. Within practical, workable guidelines this should be an attainable goal for the overall benefit of our communities. We should be able to wisely utilize our natural resources and still protect our quality of life and our environment by incorporating the technologies that are presently available to us for application to the Montanore Project. We have the opportunity to implement realistic mitigation measures that will yield practical solutions and positive overall results. We encourage you to pursue this course of action.

Sincerely,

LINCOLN COUNTY BOARD OF COMMISSIONERS

L.O. Dolezal Noel E. Williams Gerald R. Criner

Lawrence A. Dolezal   Noel E. Williams   Gerald R. Criner

Montana Department
of
Fish, Wildlife & Parks

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(406) 752-5501
FAX 406-257-0349

Ref: DV198.92
December 26, 1991

Mr. Bob Thompson
Kootenai National Forest
506 U. S. Highway 2 West
Libby, MT 59923

235 L 5 1 R MT

Dear Bob:

The Department's comments on the Supplementary DEIS for the Montanore Project follow. These comments are intended to add to, not replace, the comments submitted on the original DEIS. The original comments still represent FWP's opinion unless specifically modified herein.

Mitigation for grizzly bear, or other wildlife impacts should occur for the life of the impacts. That includes active construction and mining, reclamation and impacts that linger after mining and reclamation have been completed. The management committee should be responsible for determining when impacts have ceased.

The use of road closures for mitigation raises many questions. We do not generally support road closures more restrictive than the Kootenai National Forest standard of 0.75 miles of open road per square mile of habitat. Such restrictions may place an unreasonable burden on recreationists and other forest users. If they are used, they must be effective within objective guidelines. How many vehicles will use these road either for administrative or other use? We understand that the roads proposed for closure lead to numerous active and inactive mining claims. How much use will these mining claimants demand and how much will the Kootenai feel bound to allow?

It is not reasonable to close road seasonally and claim full mitigation credit. These same areas are used by grizzly bears periodically throughout the rest of their active period. Unless such specific lack of use can be documented, any road closure should be for the entire period that grizzlies are active. As stated in the supplement (p. 121)) "All drainages on the east side of the Cabinet Mountains are very important year-round habitat..."

What are the effects of a closed road that still allows pedestrian access? Closing the road does not restore all of the habitat value lost when the road was constructed. Even closed roads allow easy access and opportunities for human-bear conflicts. Such conflicts often result in death for the bear. Closed roads are increasingly popular hunting areas and bears that may be habituated to closed roads may be more vulnerable to human-bear interactions leading to mortality during legal hunting seasons for other species.

Thank you for the opportunity to comment on this supplement DEIS.

Sincerely,

Dan Vincent

Dan Vincent
Regional Supervisor

/bj

United States Department of the Interior

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DENVER FEDERAL CENTER, BUILDING 56, ROOM 1018
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DENVER, COLORADO 80225-0007

December 23, 1991

ER 91/1059

Mr. Bob Thompson
Kootenai National Forest
506 Highway 2 West
Libby, Montana 59923

247 L 7 1 N MT

Dear Mr. Thompson:

The Department of the Interior (DOI) has reviewed the Supplemental Draft Environmental Impact Statement (SDEIS) for the Montanore Mine Project, Kootenai National Forest, Montana and has the following comments.

Fish and Wildlife Resources

DOI provided comments on the Draft Environmental Impact Statement (DEIS) for the Montanore Mine Project, Kootenai National Forest, Montana on January 3, 1991. In those comments we stated that the DEIS did not fully disclose the impacts which were likely to result from development of the project to endangered species and wetlands, nor did it identify the mitigation the Forest Service intended to require. We specified that a SDEIS or the Final EIS (FEIS) should provide this information. The subject SDEIS has the same deficiencies. Thus, another SDEIS or the FEIS should include information from the Forest Service's biological assessment, the Fish and Wildlife Service's (FWS) biological opinion, and the 404 permit application and final wetland mitigation plan. Without these pieces of information, a complete description of anticipated impacts and identification of appropriate mitigation is not possible and does not allow for a comprehensive review of and comment on the entire proposed action. If the biological opinion and/or 404 permit are not considered in the FEIS and, thereby, the Record of Decision, the Forest Service may find it necessary to amend its documentation/decision (and allow for appropriate public review), should either the biological opinion or 404 permit require unanticipated development conditions/mitigation.

The FWS is currently involved in informal Endangered Species Act Section 7 consultation on project effects on grizzly bears. A biological opinion will be issued, based on the biological assessment. The full impacts on grizzly bears will not be determined until the biological assessment has been completed. Therefore, the FEIS should disclose impacts likely to occur to grizzly bears as revealed by the biological assessment. The FEIS

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should also describe measures that will be taken to eliminate or reduce the adverse impacts.

We are concerned that the FWS is portrayed as one of the Agencies endorsing the modified grizzly bear mitigation plan described in the SDEIS on pages 38 and 39 and discussed on pages 125-130. Through informal Section 7 consultation, the FWS had largely agreed with the approach to mitigation as stated in the DEIS. However, the Forest Service alone is responsible for the modifications to the mitigation plan appearing in the SDEIS. In fact, in several instances the FWS advised against certain measures in the modified plan before it was adopted by the Forest Service and included in the SDEIS. Consequently, we strongly object to any inference that the FWS endorses the modified plan. The FEIS should clearly identify those agencies that endorse the modified grizzly bear mitigation plan and specifically remove FWS from that list.

As noted in our comments on the DEIS, we are concerned that the extent of the long term disturbances to the Cabinet Mountains ecosystem, and the impacts to grizzly bears have not been fully disclosed. The SDEIS states that, "the mine plan as described on pages 20 through 28 of the DEIS remains essentially unchanged." The DEIS stated (page 20) that, "the deposit has not been fully delineated and likely extends further north than the available information indicates." The DEIS and SDEIS project a construction period of 3 years, a mine life of 16 years, and some period of mine reclamation, totaling more than 20 years of major disturbance in the area. Based on the DEIS that the mineral deposit is likely larger than described, it seems apparent that the mine life and disturbance period also will likely be longer than described in the DEIS and SDEIS.

The FEIS should disclose a realistic projected disturbance time period based on anticipated mineral deposits which have not yet been fully delineated. This projection could be based on development of similar mineral deposits and the chronology of original mine plans and subsequent mine expansions. The FEIS should then account for impacts and mitigation measures, if any, that would occur in that future time period.

Another factor related to the failure of the SDEIS to fully disclose long-term impacts to the Cabinet Mountains Ecosystem is a change in the Noranda Grizzly Bear Mitigation Plan. The DEIS (page 58) stated that, "Noranda would transfer title of private land in the tailings impoundment area, and the Libby Creek adit area to either the Kootenai National Forest or a private trust at the end of operations." However, regarding Noranda's Grizzly Bear Mitigation Plan, the SDEIS states that, "title transfer is no longer a component of Noranda's proposed plan." Apparently, Noranda is no longer willing to consider mitigation via transfer of title to its privately held lands or lands it may patent (mill site patents in Ramsey Creek and Libby Creek will likely be sought by Noranda). Nonetheless, in spite of Noranda's stated intent to the contrary, the SDEIS states (page 39) that, ". . . Noranda would transfer in fee title to the U.S. Forest Service any mine or mill site claims patented in conjunction with the Montanore Project." In light of Noranda's apparent opposition to such a plan, it seems very likely that private lands with legal access through Forest Service lands will remain in both Libby Creek and Ramsey Creek drainages following mining. The FEIS should disclose these impacts as permanent changes to the ecosystem affecting grizzly bears and other resource values.

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A third factor pertaining to the failure of the SDEIS to fully disclose long-term impacts to the Cabinet Mountains' Ecosystem is the indirect impact of increased mortality risk to grizzly bears due to long-term human population increases. The DEIS predicts that 88 of 111 needed new housing units will be located in rural Lincoln County at the beginning of operations in 1994, presumably near the project area. As rural homesites are developed and their owners move on or retire, the homesites themselves will remain and will be occupied. As the local economy is "boosted" by the mining activity, additional human activity within grizzly bear habitat will be stimulated. This impact from Noranda's mine will be felt "forevermore," as human encroachment into bear habitat takes place. Because the general area is a desirable location to live, it is likely that many people will remain (as will their indirect impacts of increased mortality risk) following closure of the mine. Thus, Noranda may move on after the mine life, but the human development and population increases it facilitated will likely remain. The FEIS should identify this impact (and other related impacts), predict its consequences, and address appropriate mitigation.

Regarding proposed mitigation actions to offset impacts to wetlands, the SDEIS states, "the plan presented is conceptual; a final mitigation plan will be included in Noranda's revised 404 permit application, to be submitted to the U.S. Army Corps of Engineers after this Supplement is issued." The conceptual plan lacks qualification and specificity pertaining to proposed mitigation measures. These deficiencies should be corrected in the FEIS.

Sincerely,

Barbara M. Schmalz
for Robert F. Stewart
Regional Environmental Officer

FLATHEAD
NATION

THE CONFEDERATED SALISH AND KOOTENAI TRIBES
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December 20, 1991

Bob Thompson
Kootenai National Forest
506 Highway 2 West
Libby, MT 59923

RE: Comments to Noranda Supplemental Draft EIS.

Dear Mr. Thompson:

The Confederated Salish and Kootenai Tribes of the Flathead Nation maintain their position that a mine of the magnitude proposed is incompatible with the pristine nature of the Cabinet Mountains and adverse to the historic uses of the area by the Tribal people. Nonetheless, if development does proceed, we expect it will be done with the utmost respect for the environment, and the application of all available technologies to insure minimal impacts. In that regard, we provide technical comments intended to better ensure that those resources are protected.

We appreciate the attention given in the Supplemental Draft EIS to most of our comments made on the Draft EIS. An error exists on page S-5 of the supplement in which Tribal treaty rights are misstated. The proper wording is: In Article III of the Hellgate Treaty of 1855, the Confederated Salish and Kootenai Tribes reserved "the right to fish at all usual and accustomed places... [and] the privilege of hunting, gathering roots and berries... on open and unclaimed lands."

We regret that the wetland mitigation proposal was dropped, although we recognize that it is unproven and may have some technical limitations. We appreciate the additional research done on the effects of copper on reproductive success of white sturgeon, although we maintain our contention that avoidance of additional heavy metals loading is imperative for protection of the sturgeon and the Kootenai Tribes efforts to increase the sturgeon population in Idaho.

There persists in the Supplemental Draft repeated statements that sedimentation is beneficial to the biology of aquatic systems (pages 113 and 114). Our concern is not just with the inaccuracy of these statements but with the attitude they convey. Such statements undermine our confidence that the agencies have the best interests of the aquatic resources in mind and suggest an attitude of rationalizing impacts in order to justify actions. For example: 1) particles less than 0.25 inches are identified as providing habitat for spawning, but the literature, including the article cited for support in the Draft, clearly defines that size fraction to be detrimental to spawning, 2) gravel 0.25-2 inches is correctly identified as suitable for spawning, but if this fraction is delivered to the stream due to mining activities then so will be other detrimental fractions and there will have been a failure to observe Best Management Practices as promised in the Draft, and 3) the argument that fine sediment will increase channel stability stretches reason to the limit since fines are present in those streams at a level determined by the existing hydrologic regime. Libby Creek is armored through imbrication of the substrate, and addition of fines to the point of changing channel stability would be biologically excessive.

We have argued for a "closed loop" approach to mill design, as has been demonstrated in certain other mining operations, but see little progress toward that end in the Supplemental Draft. The logic presented in the scheme to manage excess water is elusive. Are the proposed alternatives really the best available technologies? The greatest threat to water quality appears to be the tailings impoundment, and the large volume of water designed to seep through it. If the only acceptable means of tailings disposal is in an impoundment, isn't it reasonable to ensure that all contaminants remain in place, rather than encouraging them to become mobilized? Isn't the disposal of waste water in the impoundment actively encouraging the dispersal of contaminants? Rather than pumping seepage and clean groundwater back into the impoundment, isn't it more reasonable to reduce seepage by reducing process water delivered to the impoundment? With drier tailings and proper impoundment configuration, there would be less seepage to treat before release, and less land area required for disposal of tailings. If the reason for delivery of excess water to the impoundment is the desire to slurry the tailings, other options should be pursued before accepting the water surplus as a necessity. The tailings could be delivered by rail, or if slurry is the best option, an additional thickener could be positioned at the end of the pipeline before tailings are deposited in the impoundment.

We commend the proposal for use of gravel drains as a means to reduce seepage, as it is consistent with our desire to minimize groundwater contamination and delivery to Libby Creek. We don't condone the practice of pumping recovered seepage back into the impoundment. The logic behind pumping seepage back into the

impoundment escapes us. While this practice solves the immediate problem of escape, it only aggravates the long term problem. The responsible solution for dealing with seepage is treatment. Of the three treatment systems proposed, reverse osmosis or ion exchange appear the most sensible combination of removal efficiences, costs, and environmental impacts.

We find Alternative 1 to be unacceptable, since it allows the highest likelihood of environmental damage and fails to employ the best practicable technologies.

We recommmend the highest level of monitoring since it increases the likelihood of discovering impacts at the earliest time. Inadequacies persist in the macroinvertebrate monitoring plan. The ability to measure future impacts depends on the completeness of the baseline data set. Monitoring sites must be paired in order to provide replication, a measure of variance within control and impact areas, and to guard against non-mining related changes that might occur at a single site. It is imperative that at least sites LB-1000 and LB-2000 be increased to two each. On page 191 the statement is made that calculating average reference conditions has no practical meaning, and that it is difficult to produce meaningful judgements of significant differences. We recognize the problems inherent in characterizing a low-nutrient system like Libby Creek, but caution against the message that measuring future impacts may not be possible. While frequent flushing events do destabilize the fauna of Libby Creek, the community structure present there is relatively stable and capable of indicating impacts in a reliable way.

The current water quality degradation occurring in Libby Creek indicates to us the inadequacy of our ability to predict and control discharges and argues for conservatism in future project planning and implementation. We endorse the monitoring plan included in Alternatives 2 and 3, with the stipulation that there be specific plans for rapid compliance with water quality standards once any violations in standards are discovered.

These comments are in addition to those provided by the Kootenai Tribe of Idaho.

Sincerely,
Confederated Salish and Kootenai Tribes

Michael T Pablo

Michael T. Pablo, Chairman
Tribal Council

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20 December 1991

Bob Thompson
Kootenai National Forest
506 Highway 2 West
Libby, Montana 59923

Dear Mr. Thompson:

Subject: Montanore Project Supplemental Draft EIS

The Supplemental Draft EIS for the Montanore project proposes a mitigation plan for northern beechfern (Thelypteris phegopteris) which is a sensitive species in the Northern Region of the U.S. Forest Service. The population of this plant on Little Cherry Creek, one of only six in Montana, would be wiped out by the proposed tailings impoundment. Transplanting from this location to other nearby areas is proposed as mitigation.

The Montana Natural Heritage Program recommends against this action. Transplantation should not be regarded as mitigation and such action would create a precedent that could severely affect biodiversity conservation. Several problems are associated with transplanting that make it undesirable.

1. A plant population cannot be considered in isolation from its habitat. The objective of biodiversity conservation should be to maintain viable populations of species in their natural habitat not just maintain a certain number of individual plants by any means possible. Plants moved to a location they have not occupied naturally, no longer comprise a natural population and the long-term viability of such plants is very questionable. Thus, the significant loss here is of the plants in their natural habitat and transplanting does not resolve this.

2. The negative impact on the environment into which the plants are moved must also be considered. If the plants do not occur there naturally, it is likely that the habitat is not

The Nature Conservancy and Montana State Library

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suitable. Further, three years of monitoring are entirely inadequate to evaluate the viability of the transplanted plants or the suitability of the habitat.

3. Augmenting an existing northern beechfern population with transplants will likely cause an unacceptable disruption of the genetics of the population. The northern beechfern populations in Montana are peripheral to the species' range and likely contain distinctive genetic structures that adapt them narrowly to specialized habitats. Mixing plants from various of these distinct populations would alter the genetics of the populations in ways that are probably detrimental.

Concern about the precedent that could be set by regarding transplantation as acceptable mitigation has been a significant issue in other jurisdictions. Thus, in response to requests for guidance from a professional scientific body, the Canadian Botanical Association developed a policy statement on transplantation which concluded that it was an unacceptable conservation technique that would set a dangerous precedent. (Details of this are in "The Dangers of Transplantation as a Conservation Technique" by D. Fahselt, 1988, Natural Areas Journal 8: 238-244.)

Instead of the proposed transplanting, it is recommended that 1) a more thorough survey be made of the area within and surrounding the Cherry Creek population and 2) that a species management guide or conservation strategy be prepared for the species. New populations of northern beechfern were discovered in the summer of 1991 and a more complete knowledge of its range in northwestern Montana is needed to accurately assess its status. The conservation strategy should evaluate the additional information from the survey and develop measures to ensure the long-term viability of northern beechfern in northwestern Montana.

Sincerely yours,

Peter L. Achuff

Peter L. Achuff
Botanist

NORANDA'S WRITTEN RESPONSES TO PUBLIC COMMENTS

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RCVD
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April 4, 1991

Mr. Bob Thompson
Kootenai National Forest
506 Highway 2 West
Libby, Montana 59923

Re: Response to Public Comments on Montanore Project Draft Environmental Impact Statement ("DEIS")

Dear Mr. Thompson:

This letter and its accompanying materials present Noranda Minerals Corporation's ("Noranda") responses to public comments on the Montanore Project DEIS received by the United States Forest Service ("KNF"), the Montana Department of State Lands ("DSL"), the Montana Department of Health and Environmental Sciences ("DHES") and the Montana Department of Natural Resources and Conservation ("DNRC") (the "Agencies").

Noranda is providing its responses to public comment pursuant to Section 16.2.635(3) of the Montana Environmental Policy Act ("MEPA") which provides that

> In cases involving an applicant, after the period for comment on the draft EIS has expired, the agency shall send to the applicant a copy of all written comments that were received. The agency shall advise the applicant that he has a reasonable time to respond in writing to the comments received by the agency on the draft EIS and that the applicant's written response must be received before a final EIS can be prepared and circulated. The applicant may waive his right to respond to the comments on the draft EIS.

Under Section 16.2.635(3) of MEPA, Noranda is entitled to submit written responses to comments received by the Agencies on a draft EIS. In addition, the final EIS may not be prepared until Noranda's written responses are received. Noranda believes that this provision of MEPA entitles it to provide written responses to public comments received on the supplement to the DEIS and it intends to submit responses to public comments received on the supplement to the DEIS for the Montanore Project. Accordingly we request that the Agencies provide Noranda with copies of all written comments received during the public comment period on the supplement to the DEIS.

A Noranda Minerals Corp. / Montana Reserves Joint Venture

Under the National Environmental Policy Act ("NEPA") and MEPA, the final EIS must contain the Agencies' responses to substantive comments or indicate where information or conclusions have changed from the DEIS in response to such substantive comments. 40 C.F.R. § 1502.8(c) provides that

> Agencies (1) shall prepare supplements to either draft or final environmental impact statements if (i) the agency makes substantial changes in a proposed action that are relevant to environmental concern; (ii) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. (2) may also prepare supplements when the agency determines that the purposes of the act will be furthered by doing so.

Under § 1502.8, the Agencies are required to present additional and/or new information in a supplement to the DEIS. The information presented by Noranda in this letter and its accompanying materials is intended to assist the Agencies in preparing the supplement to the DEIS. Noranda requests that the Agencies incorporate the responses to public comments set forth in this letter and accompanying materials into the administrative record and carefully consider these responses during the development of the supplement to the DEIS for the Montanore Project.

The following comments address certain legal issues raised by public comments. To facilitate the Agencies' review of Noranda's responses to these comments, this letter identifies the source of the public comment and briefly summarizes it. In addition, where Noranda's response to a public comment contains both a legal component and a technical component, Noranda's technical response in the accompanying materials is identified.

1. Antidegradation/Water Quality

The Agencies received several public comment letters which raised the issue of whether groundwater discharges associated with the Project's construction and operation will violate federal and state antidegradation regulations. Public comments have focused on the DEIS' discussion of surface water quality impacts, including potential exceedances of surface water quality standards for manganese and copper, and on assertions in Noranda's Petition for Change in Quality of Ambient Waters (the "nondegradation petition") that surface water quality will not be adversely affected by the Project. The comments submitted by Libby Placer Mining Company and the Sierra Club Legal Defense Fund on behalf of the Wilderness Society are representative of these comments.

Noranda's review of the public comments received by the Agencies on water quality issues indicates that some confusion may exist regarding the statements made by Noranda in its nondegradation petition and statements contained in the DEIS regarding water quality impacts. The DEIS and Noranda's nondegradation petition describe different water quality impacts for the Montanore Project. As noted below, Noranda's nondegradation petition concludes that the Project's discharge will not result in exceedances of any surface water quality standards or impair existing or anticipated uses of the surface waters in the vicinity of the Project. In contrast, the DEIS indicates that certain water quality standards may be exceeded by the Project's discharge.

The materials accompanying this letter (1) describe the overly conservative assumptions that underlie the water quality impacts discussion in the DEIS, e.g., the metals loading analysis assumption of no attenuation or adsorption of metals in the groundwater system, (2) explain why these assumptions are overly conservative, and (3) further support the nondegradation petition conclusion that the Montanore Project will comply with applicable water quality requirements.

In general, the public comments understate or ignore a central feature of the federal and state antidegradation regulations, i.e., that some degradation of water quality is allowed under specific conditions. EPA's regulations implementing the Clean Water Act's antidegradation policy are set forth at 40 C.F.R. §131.12. Under 40 C.F.R. § 131.12, states are directed to develop and adopt a state wide antidegradation policy and identify the methods for implementing such a policy. EPA requires that at a minimum, a state antidegradation policy and implementation methods be consistent with the following:

> (1) Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.
>
> (2) Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the state finds, after full satisfaction of the inter-governmental coordination and public participation provisions of the states continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the state shall assure water quality adequate to protect existing uses fully. Further, the state shall assure that there shall be achieved the highest statutory and regulatory

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> requirements for all new and existing point sources and all cost effective and reasonable best management practices for non-point source control. 40 C.F.R. § 131.12(a)(1)-(2).

These provisions clearly allow some limited water quality degradation. Montana's nondegradation of water quality regulations, A.R.M. 16.20.701 et seq. implement federal antidegradation requirements. Section 16.20.701 et seq. allows some degradation of water quality so long as (1) existing and anticipated uses are maintained and protected, (2) applicable water quality standards are not violated, and (3) necessary economic or social developments are associated with the degradation. As described below and in the accompanying materials, the Montanore Project's discharge meets these requirements and should be permitted under Montana's nondegradation regulations.

(a) Existing and Anticipated Uses Will Not be Impaired.

Noranda's nondegradation petition, submitted by Noranda pursuant to § 16.20.704 of Montana's nondegradation regulations, as well as the materials accompanying this letter, identify present and anticipated uses of the surface and groundwater in the vicinity of the Project. These documents clearly indicate that the specific surface water quality standards identified by the State as protective of the beneficial uses of B-1 streams will not be violated. Under § 16.20.615, compliance with stream specific surface water quality standards protects the beneficial water uses set forth in the State's water use descriptions for different classifications of water, i.e., B-1 streams. Thus, the Project's proposed discharge will not impair existing or anticipated uses.

(b) Applicable Water Quality Standards Are Not Violated.

The DEIS states that water quality standards for copper and manganese will be exceeded during years 2 and 3 of Project construction. As noted above, Montana's nondegradation regulations prohibit discharges that violate water quality standards. However, the calculations on which these predicted exceedances were estimated assumed a water discharge rate from the Project's mine workings that is far greater than the limited preproduction mine workings are likely to yield. The predicted copper and manganese water quality standard exceedances rely on an assumption of 560 gallons per minute being produced from the underground mine workings immediately prior to start-up of production mining. This is the estimated ultimate mine inflow value and using this assumption is incorrect in light of the limited extent and depth of the preproduction mine workings that will exist during Project construction. As described in the accompanying materials, Noranda estimates that a significantly lower discharge rate will be produced by the preproduction mine workings. Given this reduced discharge rate, Noranda believes that the copper and manganese water quality standards will not be violated during construction and operation of the Project.

(c) The Project Will Create Necessary Social and Economic Developments.

As described in its nondegradation petition, Noranda's Hard Rock Mining Impact Plan and the accompanying materials, the Project will create necessary economic and social benefits for the area. In particular, the Project will create several hundred jobs and significantly increase the tax base of Lincoln County.

2. Separate EISs.

The comment submitted by the Association of Forest Service Employees for Environmental Ethics, Northern Rockies Chapter (DEIS comment 0086) states that each agency must prepare a separate EIS for the Montanore Project.

NEPA and MEPA clearly provide that agencies must cooperate to the fullest extent possible to reduce duplication between NEPA and state and local requirements, unless the agencies are specifically barred from doing so by some other law. See 40 C.F.R. § 1506.2(b). Under NEPA and MEPA, this cooperation to the fullest extent possible includes the preparation of joint environmental impact statements. 40 C.F.R. § 1506.2(c). Noranda suggests that the supplement to the DEIS or final EIS state that the preparation of a joint EIS by federal and state agencies for the Montanore Project is authorized and encouraged by NEPA and MEPA.

3. Air Quality.

EPA's comments on the Montanore Project DEIS raise several questions regarding the air quality impacts of the Project. Specifically, EPA has questioned (1) the basis for the determination that the Project will not be a major stationary source; (2) whether Project emissions will exceed ambient air quality standards or consume PSD increments; (3) whether the Project should develop emissions offsets for its PM-10 emissions; and (4) whether the DEIS evaluated cumulative impacts, the NO_2 increment, metals emissions, and fugitive emissions from the tailings impoundment after closure.

In general, EPA's questions are answered in Noranda's air quality permit application. The application was filed with the DHES, Air Quality Bureau on October 16, 1989 and deemed complete on January 12, 1990. Noranda recommends that EPA review the air quality permit application for the Montanore Project. The air quality permit application is part of the Project's administrative record and is incorporated by reference into the DEIS (DEIS p. 353). Under NEPA, Agencies must incorporate material into an environmental impact

statement by reference when the effect will be to cut down on bulk without impeding agency and public review of the action. 40 C.F.R. § 1502.21.

In addition to this general response, Noranda has the following specific responses to EPA's air quality concerns.

First, EPA questions whether the projected annual emission rates utilized by the Project to determine that the Project will not constitute a major stationary source subject to regulation under the Prevention of Significant Deterioration ("PSD") program are based on total potential emissions or on emissions restricted by pollution equipment or operational limitations.

Noranda's air quality permit application indicates that the annual emissions rates supporting the determination that the Project will not be subject to PSD regulation are based on the use of physical and/or operational limitations. However, the application states that "the minor source status of the Montanore Project is not dependent upon pollutant controls -- even if the wet scrubbers of the primary crushers and the mill were to be shut off, the total TSP emissions would be only 101.7 tons per year, less than the 250 tpy trigger level." (See Air Quality Permit Application, Vol. 1, p. 4-26).

Second, EPA states that "New Source Review provisions also require that the Project's air pollution emissions not be allowed to increase ambient concentrations in excess of the National Ambient Air Quality Standards ("NAAQS") nor consume the PSD Class I and Class II nitrogen oxide, total suspended particulate ("TSP") or the forthcoming PM-10 increment."

EPA's comments clearly acknowledge that the predicted emissions concentrations for the Project will not violate currently promulgated ambient air quality standards or exceed PSD increments. It is Noranda's understanding that the region in which the Project is located is deemed attainment for all criteria pollutants, and is classified as Group III for PM-10, i.e., the probability of exceeding PM-10 standards is very small. See Air Quality Permit Application, Vol. 1, p. 2-6. Noranda believes that EPA concerns regarding the adequacy of calculations and modelling used to predict emissions concentrations will be addressed if EPA reviews Noranda's air quality permit application. This application presents the detailed calculations and modelling that form the basis for the concentration estimates and impact evaluations presented in the DEIS. In particular, EPA's request that the supplement to the DEIS contain "a detailed map showing the locations and elevations of the Class I receptors, along with stack parameters and plume rise calculations" should be satisfied by Noranda's existing air quality permit application. (See Air Quality Permit Application, Vol. 1, Sections 6, 7).

In addition, Noranda notes that the Project proposes extensive emissions monitoring to ensure that relevant air quality requirements will not be violated. These monitoring requirements, as well as Project compliance of relevant air quality standards, would be enforced through an air quality permit issued by the State of Montana pursuant to its federally delegated program.

Third, EPA notes that Libby is presently a Group I area for PM-10 and it is in violation of the PM-10 NAAQS. The predicted increase of PM-10 from the Montanore Project from 256 $\mu g/m3$ to 270 $\mu g/m3$ is unacceptable and is in direct conflict with the PM-10 State of Implementation Plan ("SIP") that the State of Montana is developing. The Montanore Project should develop offsets to their PM-10 emissions, so that there is no net increase in the PM-10 concentrations to Libby area. (Emphasis added)

Noranda believes that this comment may rest on a misunderstanding by EPA regarding the source of the 14 $\mu g/m3$ PM-10 increase predicted for Libby. The DEIS states that the maximum 24-hour PM-10 contribution to Libby from the Project will be .01 $\mu g/m3$ (DEIS, p. 168). This contribution is far smaller than the PM-10 "significant" ambient 24-hour concentration of 5.0 $\mu g/m3$. The DEIS clearly indicates that the estimated 14 ug/m3 increase in PM-10 concentrations in Libby would be primarily attributable to increased population associated with Project development, e.g., increased use of wood burning fireplaces and stoves and increased motor vehicle traffic. Given Noranda's estimated PM-10 contribution, Noranda believes that EPA's comment regarding the extent of the Project's PM-10 contribution to Libby is inappropriate.

In its comments, EPA suggested that the Project develop offsets. Under Montana's air quality regulations, only PSD sources are subject to offset requirements. Montana's source impact analysis regulations state that

> (2) The owner or operator of the proposed major stationary source ... shall demonstrate that allowable emissions increases from the proposed source ... in conjunction with all other applicable emissions increases or reductions including secondary emissions, will not cause or contribute to air pollution in violation of: (a) (Any NAAQS] in any area. § 16.8.932

As noted above, the DEIS and Noranda's air quality permit application clearly indicate that the Project will not be a major source subject to PSD regulation. Furthermore, Montana's definition of "secondary emission" would not require Noranda to consider Libby's PM-10 emissions even if the Project was subject to PSD regulation. Secondary emissions "must be specific, well defined, quantifiable, and impact the same general area as the stationary source ... which causes the secondary emissions." §16.8.921(29). The emissions discussed

in the EPA comments do not meet this standard. The DEIS states that the Project is 18 miles away from Libby and is located in an area that is in attainment for all standards. Finally, Noranda notes the DEIS statement that the "Libby Air Quality Advisory Committee is developing an air quality compliance plan to reduce PM-10 levels in Libby." DEIS, p. 169. Noranda believes that activities by the Committee are the appropriate forum for PM-10 reductions in Libby.

Fourth, EPA states that the DEIS "does not provide emissions estimates for other heavy metals -- arsenic, cadmium, zinc, etc. -- which are likely to be present in the ore and in fugitive emissions from waste rock piles and the tailings impoundment, among other sources . . . Noranda should provide more data, not just an unverifiable statement that "model concentrations are less than the adopted [state] guidelines." All of the information requested by EPA is present in Sections 5.4 and 6.6 of the air quality permit application which discuss metals concentrations and metals modeling.

Fifth, EPA states that the DEIS "also fails to provide estimates of fugitive emissions from the tailings impoundment after closure, when the impoundment will continue to dry out without further additions of mine and process water. . . Provision must be made for reducing particulate emissions from the impoundment after closure, especially since the emissions will contain heavy metal particulates . . . The DEIS provides no discussion of this issue." Noranda refers EPA to the extensive discussions in the DEIS regarding reclamation of the Project site following completion of active mining. Proposed reclamation activities include topsoiling and revegetating the tailings impoundment. (See DEIS, p. 48). Performance of the proposed reclamation activities following closure of the tailings impoundment will reduce fugitive emissions to minimal levels.

Sixth, EPA states that the DEIS fails to discuss the NO_2 PSD increment. Noranda requests that the Agencies review the air quality discussion in the DEIS and, if appropriate, address the NO_2 PSD increment in the supplement to the DEIS.

4. DEIS Adequacy.

Several comments to the Montanore Project DEIS state that the DEIS is inadequate because it fails to discuss or does not discuss sufficiently a particular topic. Federal case law determining whether a DEIS or EIS is adequate considers whether the document has taken a "hard look" at the environmental factors involved in the proposed action. That is, does the EIS or DEIS contain a reasonably thorough discussion of the significant aspects of the probable environmental consequences of the proposed action? An EIS or DEIS must only provide such information as appears reasonably necessary for the decisionmakers to evaluate the project. NEPA does not require an EIS or DEIS to be so all-encompassing that its preparation would be impossible or fruitless. A DEIS or EIS will be judged under a "rule of reason," and not held insufficient because of an inconsequential or technical deficiency. Any judicial review of the adequacy of a DEIS or EIS will be deferential to the agency's expertise of the matter.

The United States Court of Appeals for the Ninth Circuit reviews the adequacy of an EIS by applying the rule of reason: "if the EIS contains a 'reasonably thorough discussion of the significant aspects of the probable environmental consequences,' a reviewing court may not 'fly speck' an EIS and hold it insufficient on the basis of inconsequential, technical deficiencies." Northern Plains Resource Council v. Lujan, 874 F.2d 661 (9th Cir. 1989), quoting Oregon Environmental Council v. Kunzman, 817 F.2d 848, 492 (9th Cir. 1987). The Northern Plains decision also stated that "the EIS review standard is limited and decidedly deferential to the agency's expertise." The EIS adequacy standard was elaborated in Marble Mountain Audubon Society v. Rice, 914 F.2d 179 (9th Cir. 1990), where the court held that it reviewed "the adequacy of an EIS to determine whether it was prepared by the Forest Service in accordance with the procedure required by law." The court determined that NEPA required the agency to take "the required 'hard look' at the environmental consequences of its decision." (Citations omitted). Similarly, the United States Court of Appeals for the District of Columbia Circuit has stated that the adequacy test for an EIS is to determine whether the

> "statement contains sufficient discussion of the relevant issues and opposing viewpoints to enable the decisionmaker to take a 'hard look' at the environmental factors and to make a reasonable decision. NEPA provides that the 'detailed statement' called an EIS must address, inter alia, 'alternatives to the proposed action.' The court must evaluate the adequacy of an EIS discussion of alternatives according to a 'rule of reason,' which governs both 'which alternatives the agency must discuss' and 'the extent to which it must address them.'"

Tongass Conservation Society v. Cheney, 1991 U.S. App. LEXIS 1697 (February 8, 1991).

In general, Noranda believes that the DEIS is adequate under these standards. Noranda encourages the Agencies to review those sections of the Montanore Project DEIS referenced in the public comments in light of the standards described above. If the Agencies determine that specific sections of the DEIS are adequate, the supplement to the DEIS or final EIS should document the basis for the Agencies' adequacy determination. If the Agencies determine that specific sections of the DEIS are inadequate, then Noranda urges the Agencies to address inadequacies in the supplement to the DEIS.

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5. OSHA/MSHA.

The comment submitted by M. Farrel on behalf of the Cabinet Resource Group (DEIS comment 0126) states that the DEIS failed to discuss certain impacts relating to air quality and worker safety issues which are regulated by the Occupational Safety Health Administration ("OSHA") and Mining Safety and Health Administration ("MSHA"). Underground air quality and workers safety measures are addressed in the Project's Plan of Operations and supporting materials, which are incorporated by reference into the DEIS. (DEIS, p. 352) The DEIS was distributed to OSHA and MSHA for their review. (DEIS, p. 333). The USFS Handbook Concerning Environmental Policy and Procedures ("NEPA Requirements Handbook") states that OSHA and MSHA may be cooperating agencies with special expertise on certain environmental quality issues. In the NEPA Requirements Handbook, MSHA or OSHA are identified as cooperating agencies for issues including mine waste control, noise in mining operations, noise in the work place, worker protection from radiation exposure in mining, worker protection from exposure to sources of radiation not covered by other federal agencies, exposure to toxic materials in mining, and other such worker-related safety and health issues.

Noranda is unaware that OSHA or MSHA have identified deficiencies in the Project's Plan of Operations or the DEIS.

Conclusion

The information presented in this letter and accompanying materials is intended to assist the Agencies in preparing a supplement to the DEIS for the Montanore Project. If you have any questions regarding these materials, please contact us.

Sincerely,

NORANDA MINERALS CORP.
MONTANORE

MW Petersmeyer

Mark W. Petersmeyer
Project Director

MWP/pr

RESPONSES TO MONTANORE PROJECT DEIS COMMENTS

Submitted by

Noranda Minerals Corp.

April 4, 1991

NORANDA'S RESPONSES TO DEIS COMMENTS

5 April 1991

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1. Libby Placer Mining Co. -- D. Cleveland (001)

A. Comment: Noranda's petition to lower water quality standards fails to satisfy the requirements of the Montana Water Quality Act.

I. Noranda's petition to lower water quality standards is prohibited by Section 75-5-302. Section 75-5-303 (1) appears to contain a loophole. In order to comply with legislative intent, this section must be narrowly construed.

Response: The petition requested a change in quality limits for groundwater and surface water in Libby creek and tributary streams to levels better than the applicable water quality standards but lower than the ambient water quality to allow the construction and operation of the Montanore mine and mill.

The BHES shall determine if the Noranda petition meets legislative intent.

II. Noranda's petition fails to satisfy the exception to the Nondegradation Policy.

Response: The petition responds to the Water Quality Bureau's letter of December 1, 1989 (see Appendix B), that contends that the Montana Water Quality act nondegradation provisions will not be met by Montanore's proposed activities.

The petition is necessitated by the fact that the proposed mining and milling operation cannot be designed without the expected occurrence of excess water from precipitation and mine inflow.

B. Comment: Noranda's petition must establish that degradation is justified for social and economic considerations.

Response: The unemployment rate in Lincoln County has varied from 8.9 percent in 1970 to a high of 15.5 percent in 1980. Since 1980, the unemployment rate in Lincoln County has averaged about 11 percent of the civilian labor force. This rate is higher than the state rate which has averaged 7 percent over the last 18 years. In addition, the Lincoln County unemployment rate within any year has varied between 10 and 18 percent

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due to the seasonality of the wood products industry. The most recent unemployment rate (September 1989) for Lincoln County was 10.0 percent, the second highest rate in the state.

Montanore would employ approximately 450 direct workers. In addition, approximately 150 to 200 secondary jobs should be created from the demand for goods and services from the direct employees. Between $12 million and $15 million in direct payroll income to the local economy could be realized, not including local purchases made by Noranda. The importance to the local economy comes not only from the increased employment and income, but particularly relates to the timing of the closure of the ASARCO Troy Unit. When the ASARCO mine closes, the local economy, already burdened with one of the highest unemployment rates in the state, would be depressed even further by an extra 450 to 500 unemployed persons. However, with the Montanore project, many of these workers would have the opportunity to continue working in the mining industry. Furthermore, with an estimated mine life of 16 years, Montanore should provide a stable employment and income base to Lincoln County for many years.

The BHES, in addition to considering the EIS, will consider economic and social need, and present and future beneficial uses of these waters.

C. Comment: No preclusion of present and future uses.

Response: The proposed change will not effect present or future beneficial uses.

The following discussion evaluates the beneficial groundwater uses peripheral to the project area and beneficial surface water uses of water in Libby Creek.

Groundwater

The net impact to present or future groundwater beneficial uses is essentially zero. Water infiltrating at the tailings pond or the land application sites contain metal and nutrient concentrations that are below the Montana Drinking Water Quality Standards. In addition, the low metals and nitrogen concentrations would be further reduced of by attenuation in the aquifer system through adsorption, transformation, precipitation, plant uptake and microbiological processes. In general, these processes will improve the quality of seepage water.

In accordance with ARM 16.20.1002, groundwater in the project area has a Class I classification. This classification states that these waters are "... generally suitable for public and private water supplies, culinary and food processing purposes, irrigation, livestock, and wildlife watering, and for commercial and industrial purposes with little or no treatment." The following describes each prescribed beneficial use and discusses potential impacts.

Public and private water supplies

No impact on public and private water supplies will occur since the quality of the resultant groundwater is better than Montana Drinking Water Quality Standards. The processes that remove nutrients and metals form the infiltration water (attenuation, adsorption, ion exchange, transformation, precipitation, plant uptake and microbiological processes) are important since these mechanisms will further reduce metal and nutrient concentrations.

In addition to water quality criteria, location of the project is important. The project is in the Kootenai National Forest in the Cabinet Mountain range. The nearest established community is Libby, MT, 22 miles from the mine area. Since the area is scarcely populated, no private wells are located in the project area and no development of groundwater supply wells in anticipated in this remote area.

Irrigation water

No irrigation development is present or anticipated for the mine area due to location, mountainous topography, climate conditions and U.S. Forest Service land control.

Surface Water

The net impact on the surface water beneficial uses is negligible. A portion of the infiltrating excess water will join the ambient groundwater and will eventually reach Libby Creek as a diffuse inflow. There will be minimal impacts to the surface water since the groundwater quality will be diluted by stream flow and/or metals and nutrients will be attenuated in the soil so that the water that enters the creek will, after dilution, be better than Montana Aquatic Life Criteria standards. The following describes each of the beneficial uses and demonstrates that there will be no impacts that restrict present or future beneficial uses.

As stated in ARM 16.20.618 (Surface Water Quality Standard), tributaries of the Kootenai River have a B-1 classification. The B-1 classification states these waters are "... suitable for drinking, culinary and food processing purposes, after conventual treatment; bathing, swimming and recreation; growth and propagation of salmonoid fishes and associated aquatic life, waterfowl, and furbearers; and agricultural and...". These beneficial uses will not be adversely affected by groundwater, including process water mixed with the groundwater that reaches Libby Creek.

Drinking, culinary and food processing purposes

No impact on drinking, culinary and food processing purposes is anticipated since the tailings/groundwater quality and resultant surface water quality are below the Montana Drinking Water Standards. The processes that remove nutrients and metals form the infiltration water (attenuation, adsorption, exchange capacity, transformation, precipitation, tree uptake and microbiological processes) are important since these mechanisms will reduce metal and nutrient concentrations that inflow into the surface water.

In addition to water quality criteria, location of the mine is important. The proposed mining facility is located in the Kootenai National Forest in the Cabinet Mountain Range. The nearest established community is Libby, MT, 22 miles from the mine area. Since the area is sparsely populated no development of surface water is anticipated in the mine area. Development of surface water and groundwater is present many miles downstream on Libby Creek; however, dilution from downstream tributaries will significantly reduce any effects of groundwater entering the creek at the project site.

Bathing, swimming and recreation

No significant impacts to bathing, swimming and recreation are anticipated since the stream water quality will be maintained above the aquatic life and drinking water quality standards.

Growth and propagation of salmonoid fishes and associated aquatic life, waterfowl and furbearers.

No impacts on growth and propagation of salmonoid fishes and associated aquatic life, water fowl and furbearers is anticipated. Non-point seepage

to Libby Creek will not change the ambient surface water quality to the point that there would be adverse affects on aquatic life and other organisms that are users of Libby Creek.

Commercial or industrial water supplies

No commercial or industrial development besides the mine facility is present or anticipated for the project mine area due to location, mountainous topography, climate conditions, and U.S. Forest Service land control.

D. Comment: No degradation below state standards.

Response: The groundwater flow system in the project area eventually will result in groundwater, containing some seepage water from the infiltration and tailings ponds, reaching Libby Creek. This water will slowly move through the aquifer and geochemical reactions between the water and the aquifer will occur resulting in attenuation of some parameters.

To assess the quality of surface water after mixing with groundwater, a hypothetical mixture of surface water and groundwater was assumed. For the analysis of potential water quality changes, the 7 day/10 year low flow for Libby Creek at Station LB-2000 was used.

There is insufficient data available to directly calculate low and average flows for Libby Creek in the project area. Information from several nearby gaged watersheds was obtained and USGS (United States Geological Survey) gaging station # 12302500 at Granite Creek was selected as the most representative, nearby station. Granite Creek joins Libby Creek approximately 15 miles north of the project area. Both the Granite Creek and the project area drainages are east facing, have similar elevations and slopes, and have similar drainage areas. As reported in Water Resources Investigations 81-62 (USGS, 1982), the 7 day/10 year low flow for Granite Creek is 5.0 cfs. Projecting this value on a proportional drainage area basis to site LB-2000 on Libby Creek yields a value for the 7 day/10 year low flow of 8.7 cfs (Table 3-3).

TABLE 3-3. COMPARISON OF GRANITE CREEK AND PROJECT AREA DRAINAGES

Site	Drainage Area (mi)	Reported 10 year/ 7 day Low Flow (cfs)	Reported Average Annual Flow (cfs)	Projected 10 year/ 7 day Low Flow (cfs)	Projected Average Annual Flow (cfs)
Granite Creek	23.6	5.0	70	---	---
LB-2000	41.0	---	---	8.7	122

REFERENCE: USGS, 1982. Walthmeyer, Scott D. and Ronald R. Shields. Streamflow Characteristics of the Upper Columbia River Basin, Montana, through 1979. U.S. Geological Survey Water Resources Investigations 81-82.

In a calculation, the 7 day/10 year low flow, streamflow and the surface water average flow was mixed with 475 gpm of groundwater and resultant concentrations of selected parameters in the mixture were determined. Nearly all parameters in the hypothetical water mixture are less than the Montana aquatic life surface water quality standards.

The resultant surface water quality calculated for the 7 day/10 year and average streamflow does not include the attenuation effects that occur during movement of groundwater through the aquifer Table 3-4). Of the parameters considered, nine of these are estimated to have higher concentrations in the tailings solution than in the ambient surface water. These parameters are aluminum, copper, iron, manganese, molybdenum, zinc, nitrate plus nitrite, ammonia and total dissolved solids. Of these parameters, there are no surface water aquatic standards for aluminum, molybdenum, manganese, nitrate or total dissolved solids. The predicted concentrations of the other four parameters in the stream at the 7 day/10 year low flow and the average flow will be less than the aquatic life standard.

Cadmium and silver present a different situation. The aquatic life standard for cadmium and silver are 0.0003 and 0.00012 mg/l, respectively. Laboratory measurement of these parameters at these concentrations is extremely difficult and the accuracy of the laboratory

TABLE 3-4. CALCULATED CONCENTRATION OF SELECTED PARAMETERS IN SURFACE WATER WITHOUT GEOCHEMICAL ATTENUATION

Constituent	Ambient Surface Water Quality (mg/l) AVERAGE	MAXIMUM	Estimated Tailings Solution Concentration (mg/l)	7-day 10 yr.** Low Flow Resultant Surface Water Quality (mg/l)	Average. Flow** Resultant Surface Water Quality (mg/l)	Montana Aquatic Life Surface Water Quality Standard
Aluminum	<0.1	<0.3	0.3	0.010869	0.000861	NS
Arsenic	<0.005	<0.005	<0.005	<0.005	<0.005	(0.05)
Cadmium	0.0004	0.0004	0.002	0.000573	0.000413	0.0003
Chromium	<0.02	<0.02	<0.02	<0.02	<0.02	0.011
Copper	<0.001	0.003	0.02	0.002373	0.000172	0.003
Iron	<0.05	0.06	0.08	0.008695	0.000683	(0.3)
Lead	<0.001	<0.001	<0.01	<0.01	<0.01	0.0004
Manganese	<0.02	<0.02	0.4	0.043678	0.003444	(0.05)
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.000012
Molybdenum	<0.05	<0.05	0.07	0.007608	0.000602	NS
Zinc	<0.02	<0.02	0.05	0.005434	0.000430	0.027
Silver	<0.0002	0.0006	0.002	0.000217	0.000017	0.00012
NO3 + NO2 as N	0.068	0.12	10	1.147565	0.153522	(10)
Ammonia, Total	<0.05	<0.1	5	0.543678	0.043053	2.2*
Tot. Diss. Solids	16.92	41	131	29.32	17.90231	(500)

NS = No Standard
(number) = Drinking water standard shown. There is no aquatic standard.
* Temperature and pH dependent
** Assuming a 475 gpm (30 l/s) application rate, a 246 l/s 7-day 10 yr. low flow and a 3456 l/s average flow of Libby Creek at station LB 2000
• Montana Aquatic Life Water Quality Standard for a hardness of 20 mg/l

analysis at these concentrations is questionable. Cadmium concentrations in groundwater are controlled by adsorption onto solid substrates (U.S. EPA, 1979). Numerous investigators have reported adsorption of cadmium by many different geological materials. Huang, et al. (1977) describes adsorption of cadmium by aluminum oxides, silica and soils. Organic matter also has been shown to be an important medium for cadmium adsorption. As a result of movement of cadmium-bearing groundwater through the aquifer, it is expected that the cadmium concentration will be significantly decreased.

Silver is adsorbed by a variety of materials including sediments and organic deposits. Manganese dioxide has a strong affinity for the metal as well as ferric hydroxide and clay minerals. Work on silver adsorption has shown that whenever manganese or iron hydroxides are present, silver is almost immediately adsorbed and will be relatively immobile in the water column (EPA, 1979). Organic materials also have been found to adsorb silver. This information indicates that silver concentrations in groundwater will be significantly decreased by adsorption in the aquifer during travel from the water disposal sites.

Based on the strong adsorption of silver and cadmium by earth materials and organics, it is assumed these metals will be reduced in the groundwater system to a concentration that will not cause a measurable change in the quality of the stream by the time the groundwater reaches the stream.

E. Comment: Noranda's proposal for control of groundwater pollution is inadequate on its face.

I. Noranda's analysis is based on faulty data.

Response: Reference letter Chen-Northern (T. Grotbo), reproduced on page 11.

II. Noranda's proposal for mine waste water disposal fails to address long term pollution control requirements.

Response: Reference Morrison-Knudsen Engineers reports "Pressure Relief and Seepage Control Conceptual Design" and "Post-Operational Seepage Analysis".

Chen-Northern, Inc.
Consulting Engineers and Scientists

MEMORANDUM

DATE: October 1, 1990

TO: Doug Parker

FROM: Terry Grotbo

Re: Footnote Explanation

Appendix J2 of the Water Resources Baseline Investigation Report contains data validation statements for groundwater samples collected as part of the baseline study for the Montanore Project. The data tables contained in the Precision Statements section of Appendix J2 have two footnotes at the bottom of each data set. Footnote 1 indicates that all quantities listed in each table are in mg/L unless otherwise noted. Footnote 2 indicates that no valid sample data was found for this site. A search of all the tables in the precision statement section of J2 reveals that footnote 2 only applies to Stations SP-004 and SP-005, both of which are springs. The footnote also applies to a single parameter (Fluoride) in these two tables.

Fluoride measurements (laboratory results) were not considered statistically valid since either the cross-contamination blank or the bottle blank for this parameter was "out of bounds" based on the pre-selected criteria for data validation.

The appearance of Footnote 2 on all data pages in this section may be confusing, however the footnote only applies to SP-004 and SP-005 data.

If you have any questions or wish to have a revised set of these tables (without footnote 2), let me know.

III. When the requirements of Section 75-5-303 (1) are not satisfied, Section 75-5-303 (2) requires water treatment.

Response: The loading calculations provided in the DEIS and the resultant exceedances are evaluated within the context of surface water standards. This follows the "worst case" analysis that was requested for the petition. Technically, the first receiving water for all points of discharge in Noranda's proposed plan is groundwater. Groundwater quality standards are based primarily on Drinking Water Standards. As such, the discharge of excess waters generated by the mining development should be analyzed for exceedance of groundwater standards.

The following is a mass loading analysis for copper loading to groundwater which utilizes the following assumptions:

- Mine water - 1.25 cfs @ .073 mg/l copper concentration
- Adit water - 0.87 cfs @ .010 mg/l copper concentration
- Ambient Groundwater - 0.46 cfs flux @ 0.0133 mg/l copper concentration

Resultant mine water/adit water copper concentration = 0.047 mg/l.
Resultant mine water/adit water and ground water copper concentration = 0.041 mg/l

The Montana groundwater quality standard for copper is 1.0 mg/l. Therefore, these calculations indicate that no violation of Montana's groundwater quality standard would result from the disposal of excess waters generated by Noranda's proposed development.

IV. Noranda has failed to adequately explore water treatment alternatives.

Response: Reference "Water Treatment Evaluation" -- Camp Dresser McKee.

2. Ridin' P Ranch - Switzer (0006)

A. Comment: Oppose Alternative #6

Response: Alternative #6 has been shown in the analysis to have more impacts to riparian areas. It has more structure exposure to flood plains. There are more impacts to private lands (other than Champion who has agreed to a right of way). The line route for Alternative #6 is a mile longer, with

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the additional surface disturbances and energy losses, and Alternative #6 has more structures above 2000 elevation, with more exposure to icing and structure failure.

The project proposal or Alternative #4, given that construction would be scheduled during the normal construction period, have no more impacts to visuals or wildlife, and the impacts of Alternative #6 would be avoided.

3. Sierra Club Legal Defense Fund Inc. on behalf of Wilderness Society.

A. Comment: Project will violate National Clean Water Policy and Goals.

Response: Montana has a state approved plan authorized under the Clean Water Act and administered by the DHES. The aquatic life criteria developed by EPA (1986) use lowest observed effect data from a variety of sources and generally, upon application of a factor of safety, provide a value at which no effect on aquatic species can be expected. The EPA clearly states in the Gold Book that the criteria are intended as guidelines and not standards.

The DEIS correctly indicates that the EPA Gold Book equations may not be reliable (Pg. 204-205) and that there are difficulties in determining impacts to aquatic life at the low levels of metals and low hardness levels expected in these streams. However, fish are known to acclimate to much higher levels of metals than are predicted for Libby Creek and apparently survive in streams traversing other mineralized areas in the Libby area.

Noranda disagrees with the DEIS interpretation that manganese is a toxic and deleterious substance and must be regulated under the non-degradation policy. Manganese is included in the Gold Book discussion because of the aesthetic effects of staining laundry and laboratory fixtures and taste. The Gold Book clearly indicates that toxicity to aquatic organisms is not a concern at the manganese levels projected for the mine and tailings waters.

The loading calculations provided in the DEIS and the resultant exceedances are evaluated within the context of surface water standards. This follows the "worst case" analysis that was requested for the petition. Technically, the first receiving water for all points of discharge in

Noranda's proposed plan is groundwater. Groundwater quality standards are based primarily on Drinking Water Standards. As such, the discharge of excess waters generated by the mining development should be analyzed for exceedance of groundwater standards.

The US EPA regulations allow changes to existing quality under the Clean Water Act provided present or future beneficial uses are not precluded.

B. Comment: Project will violate Montana's Environmental Policies and Goals.

Response: The DEIS indicates that an exceedance of Montana's water quality standards would be realized should Noranda's proposed development be permitted. These exceedances are unlikely to occur. This impact analysis should focus on the expected changes in water quality as they relate to aquatic life and current beneficial uses of Libby Creek. A finding that no significant impacts to beneficial uses should be made based on this analysis.

The BHES cannot permit violations of Montana's Environmental policies and goals.

C. Comment: Project will violate Montana Water Quality Act - Nondegradation Provisions.

1. Project has failed to demonstrate that the degradation is justified by necessary social-economic development.

Response: **Economic Environment**

Current Conditions

Employment and Income

The major source of employment in Lincoln County is manufacturing (wood products industry), comprising over 20 percent of all employment in the county. The second major employer is the mining industry which currently accounts for approximately 7.5 percent of all jobs in the county. The major wood products employer is Champion International (700 employees), while ASARCO and W.R. Grace Inc. are the major mining

employers (500 employees). Both industrial groups are among the highest paying jobs in the county, with the wood products jobs typically paying 123 percent of the average county job and the mining industry paying 153 percent of the average county job. (W.R. Grace effected a complete, final closure on Sept. 30, 1990)

The civilian labor force in Lincoln County has grown from 7,275 in 1970 to 8,725 in 1988, representing a 19.9 percent increase in 18 years. This is a much slower growth rate when compared to the 47.3 percent increase in the statewide labor force over the same period.

The unemployment rate in Lincoln County has varied from 8.9 percent in 1970 to a high of 15.5 percent in 1980. Since 1980, the unemployment rate in Lincoln County has averaged about 11 percent of the civilian labor force. This rate is higher than the state rate which has averaged 7 percent over the last 18 years. In addition, the Lincoln County unemployment rate within any year has varied between 10 and 18 percent due to the seasonality of the wood products industry. The most recent unemployment rate (September 1989) for Lincoln County was 10.0 percent, the second highest rate in the state.

Projections of employment and income for Lincoln County indicate very little growth over the next 20 years. The ASARCO mine at Troy, which commenced mining in 1980, is scheduled to close between 1992 and 1995. The mine employs approximately 350 workers and 125 to 150 secondary jobs were created as a result of the ASARCO workers. Estimates of annual income to the county due to the wages and salaries of these employees exceed $10.0 million per year. In addition, ASARCO expends monies on local purchases for sevices, supplies and materials at the mine.

Local Government Finances.

The taxable valuation of Lincoln County peaked in 1986 at $36.5 million. Since that time, valuation has declined 14.3 percent to $31.3 million in fiscal year 1989. With the statewide freeze in allowable millage, the decline in taxable valuation has created an enormous constraint on the Lincoln County budget. The current millage (44.98 mills) includes 11.44 mills for general government and 12.0 mills for the poor fund (state assumption of welfare).

A similar situation exists in Libby. In fiscal year 1980, the taxable valuation was $3.8 million, and by fiscal year 1988, valuation had declined

by 21 percent to $3.0 million. Libby has an all-purpose general fund levy of 61.62 mills, which is slightly lower than the 1986 rate of 62.96 mills. As is true with nearly all local governments in Montana, financing the budget of Libby has become difficult with the eroding tax base and the freeze on allowable millage.

Similar to the county valuation, the schools in Libby also have experienced a decline in taxable valuation. Both the High School District and the Elementary School District peaked in taxable valuation in fiscal year 1986 at $20.6 million. Taxable valuation decreased to $19.6 million in fiscal year 1988, representing a decline of nearly 5 percent.

The valuation of the ASARCO Troy Unity amount to approximately $4.0 million per year in property valuation and $1.5 million in gross proceeds valuation. This valuation represents approximately 17.5 percent of the tax base in Lincoln County. The closure of the ASARCO Troy Unit would have a severe impact on local government services in Lincoln County.

Economic Benefits of Montanore

Employment and Income.

Montanore will employ approximately 450 direct workers. In addition, approximately 150 to 200 secondary jobs should be created from the demand for goods and services from the direct employees. Between $12 million and $15 million in direct payroll income to the local economy could be realized, not including local purchases made by Noranda. The importance to the local economy not only comes from the increased employment and income, but particularly relates to the timing of the closure of the ASARCO Troy Unit. When the ASARCO mine closes, the local economy, already burdened with one of the highest unemployment rates in the state, would be depressed even further by an extra 450 to 500 unemployed persons. However, with the Montanore project, many of these workers would have the opportunity to continue working in the mining industry. Furthermore, with an estimated mine life of 16 years, Montanore should provide a stable employment and income base to Lincoln County for many years.

Local Government Finances.

The Montanore project would add approximately $9.7 million to the taxable valuation of Lincoln County when it is completed. The taxable

value in the county would increase by over 30 percent and more than offset the expected loss in taxable value from the closure of the ASARCO mine. In addition, because of the Tax Base Sharing Act, a portion of the taxable value would most likely be assigned to Libby. (Depending on the number of workers residing in Libby, but limited to 20 percent) Since both Lincoln and Libby governments have experienced declines in their respective tax bases over the past few years, the Montanore project should be a welcomed addition to the economic base of the area.

Both the Libby Elementary School District and the High School District would benefit from the additional taxable value of Montanore. The taxable value from the project would increase the total valuation for each school district by nearly 50 percent.

The State of Montana would benefit from the Montanore project because the $15.0 million payroll should provide approximately $450,000 in payroll tax revenue (assuming a marginal tax rate of 3 percent). In addition, the Metal Mines Tax and the Resource Indemnity Trust Tax would provide revenue to the state budget.

Social Environment

Current Conditions

Social Life.

Social structure and interaction in the Libby/Troy area has been shaped primarily by geographic isolation, migration and settlement, resource extractive economy, extra-local influence on the economy, and a cyclical economy. Residents of Lincoln County, because of their livelihoods, are closely linked to the natural environment, have a conservation ethic, but do not favor preservation that would prohibit development of natural resources.

Libby area residents have adapted to the cyclic nature of the economy by living off the land (i.e., hunting, fishing, gardening, firewood gathering, and berry picking) and developing "do-it-yourself" skills. Residents generally support commercial and industrial development of the region as long as reasonable protection of land, water, and other resources is assured. Intelligent use of natural resources, not just protecting them for future generations, is a dominant concept of the culture of Lincoln

County and other communities which strongly rely upon natural resources for individual and community survival.

Community Services.

Community services are generally viewed by local residents as average or above average. With the exception of law enforcement and solid waste, community service providers reported that services and facilities were adequate to serve the people of the area.

The Lincoln County Sheriffs Department, a consolidated law enforcement agency with the city of Libby, needs 3 more patrol officers to adequately meet the police protection needs of the community. This need for additional officers is most apparent when an officer is on vacation or sick leave which leaves the department short-handed.

Landfills in Lincoln County are approaching capacity. In addition, due to new Environmental Protection Agency (EPA) regulations that will requires extensive and costly monitoring of landfills, the County is investigating alternative methods of reducing the number of landfills. The EPA regulations may force the county to close the Eureka landfill and to haul the Eureka area refuse to the Libby landfill. If Eureka solid waste were deposited at the Libby landfill, the useful life of the landfill would be shortened.

Social Benefits of Montanore

Social Life.

Social well-being is a subjective concept based upon individuals' perceptions of how their lives compare with their expectations of themselves and the community in which they reside. Indicators of social well-being include the incidence and rate of certain behaviors such as crime, divorce, suicide, family violence, alcohol/drug abuse, welfare rates, school dropouts, and unemployment. Except for the unemployment rate in Lincoln County, most of these social indicators are below the state average. Without the inclusion of the Montanore project into Lincoln County and with the scheduled closure of the ASARCO Troy Unit, unemployment in Lincoln County could climb dramatically. A decrease in the employment base would adversely affect young people entering the job market seeking local employment so that they may stay in the community close to family and friends. In addition, some out-migration

would occur and, without the population base, businesses may be forced to close for lack of retail trade.

A quality of life survey conducted with Lincoln County residents indicated that the economy of Lincoln County was viewed as depressed to stable, and not able to provide adequate employment. Most people interviewed believed that the proposed Montanore project would have a positive effect on the local economy, job market, and tax base.

Community Services.

When the ASARCO Troy Unit closes and if no new employers move into the area, some out-migration would occur due to lack of employment opportunities. People in the area would either have to pay higher per capita rates to maintain the current level of services (i.e., police and fire protection, water, sewer) or the services would have to be reduced. Unemployed people who choose to stay in the area may be forced to use welfare services.

The Montanore project could provide employment opportunities for those individuals laid off from ASARCO due to closure. In addition, newcomers to the area gaining employment at Montanore would create the need for secondary employment and local businesses would become more stable in retail trade.

Other Regional Developments

At the present time there are no alternative developments to the proposed project. Should Montanore not develop, the economic and social well-being of the area would continue to decline (i.e., high unemployment and a continued deteriorating tax base). When ASARCO closes the Troy Unit, the situation would become further aggravated, and, although ASARCO anticipates opening a mine near Noxon in Sanders County (Rock Creek Project), Lincoln County would benefit only if some Rock Creek employees lived in Lincoln County and commuted to the mine. (Montanore Project - Hard Rock Impact Plan - December, 1990)

D. Comment: Project failed to demonstrate that change in water quality would not preclude present or anticipate uses of affected water.

Response: Water Quality

I. Mass Loading Analysis

a. Assumed Discharge Rate

The DEIS predicts that the water quality in Libby Creek at site LB-800 will exceed the selected beneficial use criteria for copper and manganese during Years 2 and 3 of construction, according to the discharge scenario referred to as "Following mine and adit water discharge" (DEIS Figure 4-2, Pg. 187). These exceedances are based on the loading calculations for copper and manganese presented in Table 6-11 (Pg. 319).

The discharge scenario leading to the predicted exceedances is predicated on the discharge to Libby Creek of 0.87 cfs (392 gpm) of water produced in the three adits and 1.25 cfs (560 gpm) of water produced in the underground mine workings. Based on the expected copper and manganese content of these waters the DEIS uses a dilution model to estimate the resultant concentrations in Libby Creek.

The exceedances are predicted to occur only for the time period immediately prior to start-up of production and once the facility is in full operation the diversion of underground water to the mill alleviates the predicted exceedances.

The discharge scenario used to predict the exceedances relies on the assumption of 1.25 cfs (560 gpm) of water with an elevated copper content of 0.073 mg/l being produced from the underground mine workings immediately prior to start-up of production mining. This assumption is incorrect and appears to be based on a misunderstanding as to the extent of underground workings which are in place prior to mill start-up.

No mining will be undertaken prior to the start-up of the mill facility for full production. Other than the three adits driven for access, conveyance, and ventilation there will be minimal underground workings, comprising the "mine", in place prior to start-up. These pre-production workings are limited to the immediate vicinity of the lower ends of the adits and

contain the necessary infrastructure and initial access for the start-up of mining.

Given the limited extent and depth of the pre-production "mine" workings, it is not reasonable to attribute a flow of 1.25 cfs into these workings. The method used to predict the inflow into the adits estimates an inflow rate of less than 1 gpm per 1000 linear feet of workings at the lower end of the adits. Using this inflow factor and the approximately 8000 linear feet of pre-production mine workings results in a flow contribution of approximately 0.018 cfs (8 gpm) instead of the 1.25 cfs (560 gpm) used in the DEIS analyses. Applying this mine inflow rate to the dilution analyses results in the following concentrations in Libby Creek:

Concentration in Libby Creek at:

Parameter	8 gpm	560 gpm	Exceedance Criterion
Copper	<0.003 mg/l	<0.016 mg/l	0.003 mg/l
Manganese	<0.007 mg/l	<0.11 mg/l	0.05 mg/l

Therefore, due to extremely limited extent of pre-production workings, it is incorrect to predict an exceedance of the copper and manganese criteria for Libby Creek during the period immediately preceding production start-up and the FEIS should reflect these revised concentrations. Additionally, applying the Troy mine water quality values to pre-production workings inflow may be an unduly harsh "worst case" approach.

b. Conservative Assumptions

Pg. 316 of the DEIS states that the impact writers feel that the proposed analysis does not represent either a "worst case" or a "best case" scenario. We feel that this simplistic "loading" calculation represents a clear "worst case" analysis and that it is overly conservative.

The treatment of reported values below the detection limit as values at the detection limit is extremely conservative.

The analysis assumes dilution with the 7 day, 10 year low flow discharge in Libby Creek.

The analysis also assumes that Libby Creek in the vicinity of LB-800 and LB-2000 represents a gaining reach through all flow conditions. A review of the flow data collected during the collection of surface water quality samples suggests that this is not the case. For example, flow at LB-800 on 4/28/88 was 157.8 cfs while the flow at LB-2000 on 4/27/88 was 95.3 cfs. Conversely, on 8/17/88, the flow at station LB-800 was 7.3 cfs while the flow at LB-2000 on 8/17/88 was 9.8 cfs. This suggests that Libby Creek in the reach between LB-800 and LB-2000 may not experience significant groundwater inflows on a continuous basis.

The analysis does not include any reduction in copper or manganese values due to dilution from present groundwater flux, dispersion of trace metals due to mechanical processes, or adsorption of metal ions on either soil particles or silts and clays within the saturated zone. The fact that these processes may be difficult to quantify in this setting does not preclude their discussion in the impact analysis. Since dilution, dispersion, and adsorption may result in significant reductions in the concentrations of copper and manganese reaching Libby Creek, the analysis is overly conservative.

II. Impact Analysis

The DEIS indicates that an exceedance of Montana's water quality standards would be realized should Noranda's proposed development be permitted. As noted above, exceedances are unlikely to occur. This impact analysis should focus on the expected changes in water quality as they relate to aquatic life and current beneficial uses of Libby Creek. A finding that no significant impacts to beneficial uses should be made based on this analysis.

III. Receiving Water

The loading calculations provided in the DEIS and the resultant exceedances are evaluated within the context of surface water standards. This follows the "worst case" analysis that was requested for the petition. Technically, the first receiving water for all points of discharge in Noranda's proposed plan is groundwater. Groundwater quality standards are based primarily on Drinking Water Standards. As such, the discharge of excess waters generated by the mining development should be analyzed for exceedance of groundwater standards.

The following is a mass loading analysis for copper loading to groundwater which utilizes the following assumptions:

- Mine water - 1.25 cfs @ .073 mg/l copper concentration
- Adit water - 0.87 cfs @ .010 mg/l copper concentration
- Ambient Groundwater - 0.46 cfs flux @ 0.0133 mg/l copper concentration

Resultant mine water/adit water copper concentration = 0.047 mg/l. Resultant mine water/adit water and ground water copper concentration = 0.041 mg/l

The Montana groundwater quality standard for copper is 1.0 mg/l. Therefore, these calculations indicate that no violation of Montana's groundwater quality standard would result from the disposal of excess waters generated by Noranda's proposed development.

IV. Soil Attenuation

Attenuation processes for manganese and copper are expected to support the proposed land application of adit/mine water at the Montanore site. Review of the literature on Mn and Cu attenuation and leaching in soils, and attenuation predictions based on the literature are provided in this section.

a. Manganese Attenuation

Manganese (Mn) is a multivaliant element which can exist in the +2, +3, +4, and +7 oxidation states. The predominant aqueous oxidation state is Mn (II). The attenuation of aqueous Mn (II) in soils is not well understood, and a multitude of possible processes may affect concentrations in soil pore waters.

Solubility control of Mn is thought to be primarily a function of the pH-Eh state of the soil environment. Under relatively low pH/high Eh conditions, Mn (II) concentrations may be controlled by the solubility of Mn oxide of hydroxide phases as a function of Eh. Under high Eh (oxidizing) conditions, oxide/hydroxide solubility will be low and aqueous Mn concentrations may be depressed toward analytical detection limit levels in the ppb range. Conversely, under moderately low to low Eh conditions, oxide/hydroxide solubility will be high and aqueous Mn concentrations may be elevated to the ppm range.

The natural Eh state of the Montanore soils, along with possible induced changes in Eh imposed by the land application of adit/mine water, are currently unknown. It is anticipated that conditions may tend toward low Eh for the following reasons: (1) the forest cover at the site likely has resulted in accumulation of organic litter, which may induce low Eh conditions in the surface soil environment as a result of bacteria-mediated decay of organic matter; (2) saturation of the soils by disposed adit/mine water may promote reducing (low Eh) conditions; and (3) the chemistry of the adit/mine water may be of low Eh, which would tend to lower the Eh of the soil environment during application.

Assuming low Eh conditions will predominate at the site, aqueous Mn concentrations probably will not be controlled by oxide/hydroxide solubility. If Mn concentrations are controlled by oxide/hydroxide solubility under low Eh conditions, then aqueous concentrations will be high and land application may induce the leaching of Mn present as oxides/hydroxides within the soil matrix. If, on the other hand, oxide/hydroxide solubility is not the controlling parameter, then other attenuation processes will control aqueous Mn concentration in the soil environment.

In the absence of oxide/hydroxide solubility control, the mechanisms controlling aqueous Mn concentrations in soils will be some combination of adsorption, cation exchange, and complexation with dissolved organic matter. Because Mn is an essential micronutrient, organic complexation may be a particularly important and complicating factor, and many studies have shown that organic complexation tends to increase aqueous Mn concentration in soils. Cation exchange is believed to be an important mechanism in soils with high clay contents; however, relatively few studies have shown significant correlation with cation exchange capacity (CEC). Most results indicate that specific adsorption of Mn onto solid surfaces is the primary controlling mechanism. Adsorption capacity appears to be correlated primarily with the quantity of solid organic material present in the soil, secondarily with the quantity of finely crystalline and/or amorphous oxide and hydroxide phases, and to a smaller extent with the quantity and type of clay minerals.

Literature values for Mn adsorption parameters in soils were evaluated to predict Mn attenuation at the Montanore site. Shuman (1977) tested Mn adsorption (batch-type study) in four acid soils, ranging from a clayey loam to a loamy sand. These soils are expected to be similar to those at the Montanore site. Results corresponded closely with the Langmuir isotherm model over equilibrium Mn concentrations ranging between 2 and 64 mg/l. Note that Mn concentrations at the Montanore site are expected to be much less than 2 mg/l, and that no studies for any soil types were found where Mn concentrations in test solutions were below 2 mg/l.

Using the empirical adsorption parameters determined for the Shuman (1977) soils, and assuming an average Mn concentration of about 0.4 mg/l in applied adit/mine water, equilibrium Mn concentrations were calculated for various soil/solution (wt/wt) ratios. For example, the calculations predict that Mn concentrations in soil pore water would be lowered to between 0.005 and 0.026 mg/l for a soil solution ratio of 1. Higher soil/solution ratios would result in lower Mn concentrations and lower soil/solution ratios would result in higher Mn concentrations (up to a maximum of 0.4 mg/l). The soil/solution ratio generally reflects the number of pore volumes (PV's) allowed to leach through the soil The precise relationship between soil/solution ratio and PV requires comparison with column studies, which may then be used to establish the mass of soil or size of application area required to treat the predicted Mn load. From discharge data in the DEIS, the total Mn load over the three year discharge period is estimated to be about 162 lbs.

These results suggest that Mn concentrations below regulatory standards (0.05 mg/l) are achievable, provided that the Montanore soils are similar, a large enough soil mass is available, and extrapolation of the results to low Mn concentration is valid. The actual size requirement may be more a function of the infiltration capacity of the soil than the attenuation capacity.

b. Copper Attenuation

Copper in aqueous solutions can exist in either the +1 or +2 oxidation states. Cu (I) predominates under reducing (low Eh) conditions and Cu (II) predominates under oxidizing (high Eh) conditions. Maximum Cu concentrations in soils may be controlled by oxide/hydroxide, ferrite, or carbonate solubility. However, cation exchange and adsorption processes usually predominate. Typically, cation exchange is important only in solutions with relatively high Cu concentrations. Organic complexation does not appear to be as important of a process for Cu as it is for Mn.

Thus, specific adsorption onto solid surfaces is expected to be the primary control on Cu concentrations in soils, especially under low aqueous concentration as expected at the Montanore site.

More information is available on Cu adsorption than is available for Mn. Batch test results were compiled for several soils that are similar to soils at the Montanore site (McLaren and Crawford, 1973; Cavallaro and McBride, 1973; Sidle and Kardos, 1977; Petruzzelli and Lubrano, 1978). As with Mn, Cu adsorption in these soils generally follows the Langmuir isotherm model. The aqueous Cu concentrations tested ranged between 0.06 and 20 mg/l. For comparison, adit/mine discharge water is expected to have a Cu concentration of about 0.07 mg/l.

Using typical adsorption parameters, calculations predict that Cu concentrations in soil pore water at the Montanore site would be lowered to between 0.00002 mg/l for a soil solution ratio of 1, which is below the regulatory standard of 0.003 mg/l. The total Cu load during the three year application period is estimated to be only about 28 lbs. Thus, Cu should be even more effectively attenuated than Mn by the application area soils. Again, all of the assumptions and limitations described earlier for Mn also apply for Cu.

4. Doug Griffiths

A. Comment: Project should mitigate for poaching.

Response: The project has proposed to mitigate for poaching through I&E programs, a firearms policy, and funding of additional MDFWP personnel.

5. Celeste Engel

A. Comment: Is quality of waste rock correct?

Response: The original table was correct for tons, however the cubic yard calculations were in error. This revised table on page 27 has been corrected. The net result was a reduction in the yards previously shown.

ESTIMATED SCHEDULE FOR WASTE ROCK PRODUCTION & DISPOSAL
(,000 tons/yards^3)

	Year 0-2	Disposal Area
Libby Adit	450/200	Tailings Impoundment
Ramsey Adits	---	---
Mine Development	---	---
	Year 2-5	Disposal Area
Libby Adit	500/222	Tailings Impoundment
Ramsey Adits	600/267	Tailings Impoundment
Mine Development	100/44.4 (waste) 333/148 (ore)	Inside Mine Temporary Storage Waste Disposal Site #1
	Year 5-10	Disposal Area
Libby Adit	500/222	Tailings Impoundment
Ramsey Adits	500/222	Tailings Impoundment
U/G Mine Development	500/222	Inside Mine
	Year 10-20	Disposal Area
Libby Adit	---	---
Ramsey Adits	---	---
U/G Mine Development	1000/444	Inside Mine
Life-of-Mine Total	4,150/1,844	

Note: Waste Rock from the Ramsey Creek adit development will be temporarily stored in the waste rock dump during years 2-10 prior to being used in tailings impoundment construction.

B. Comment: The area will collapse.

Response: General

Existing rock mechanics data and analyses describing the pillar design are contained in the Redpath report dated February 1991. The proposed pillar design will allow mining to occur without any surface subsidence.

C. Comment: What are the reagents used in the milling process?

Response: Ore Processing Reagents

General

The use of reagents in a flotation process is a key to the recovery and separation of the desired product(s) and to its saleability and marketability. Based on the metallurgical testing conducted to date, the reagents required for the Montanore process are as shown in Table 2-3, Pg. 33 of the DEIS.

The reagents are expected to report, almost completely, to the concentrates with the balance remaining with the tailings slurry. Appreciable concentrations of these materials will not occur in tailings pond water of the tailings solids.

These reagents are organic compounds and subject to biodegradation in the environment. This is particularly the case for xanthates and MIBC. The flocculants are more stable and likely to remain bonded to the tailings.

Toxicity data are sparse for these reagents, and none of them have received criteria specifications by the EPA. There are no known cases where any of these reagents have created serious environmental problems at concentrations expected in the Montanore tailings impoundment.

The organic reagents proposed for use may be characterized as biodegradable with relatively low toxicity. Experience at operating mills indicates most of the organics would be substantially destroyed in the tailings impoundment. Their concentrations would be controlled by reagent addition at levels needed to maintain process effectiveness. The organic reagents are not on U.S.E.P.A.'s priority pollutant list. Removal of organics in the mill circuit would occur by adsorption on tailings,

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preferential concentration in the ore concentrates, and chemical or biological decomposition in the tailings pond (State of Wisconsin, 1986). Concentration of calculated residuals at the tailings impoundment (end-of-pipe) are approximately 3 ppm for Xanthates and 1.5 ppm for MIBC (see following concentration calculations). Concentrations in the pond water are expected to be lower due to dilution and degradation. Actual concentrations in the tailing circuit will depend on variations in the ore, process, flow rates, and reagent dosage.

CALCULATION OF CONCENTRATION OF REAGENTS IN TAILINGS:

Reagent usage
Xanthates
0.04 lbs/ton
@ 20,000 TPD = > Total lbs Xanthates = 800 lbs/day
= 363 kg/day
MIBC & Percol
0.02 lbs/ton = > 400 lbs/day = 181.5 kg/day

Water to Tailings Impoundment In Year 10
2029 GPM = 11,060 metric tons/day

90% of Xanthates & MIBC Reports to Concentrates then 10% or 36.3 kg/day to tailings

Concentrate Xanthates = 36,300 g/11,060 metric tonnes
= > 3.28 ppm
MIBC = 1/2 or 1.64 ppm

Categorical

1. Xanthates (Potassium Amyl Xanthate)

The xanthates used in flotation are generally prepared from an aliphatic alcohol, carbon disulphide, and caustic soda or caustic potash (Ministry of the Environment, 1977).

Xanthates are completely water soluble and are relatively stable solids. When pure, they are nearly white and have no odor. The commercial product, however, which ordinarily has undergone exposure to air, has a characteristic odor and may range in color from near white to deep yellow (Ministry of the Environment, 1977).

Economic operation dictates that only enough xanthate is added to activate the metals in the ore. The xanthates attach to the metal, and since they are hydrophobic, float the valuable minerals away from the host rock. Some of the xanthates will stay with the gangue material (tailings) or the water that reports to the tailing impoundment (Personal Communication, Jeff Austin, November 1990).

In a mineral milling operation, a majority of the xanthates report to the concentrates with the remainder going to the tailings impoundment dissolved in the water or adsorbed to pyrite. The fraction with the water generally breaks down to simple organic compounds as a result of exposure to ultraviolet light and oxygen. The xanthates bonded to the pyrites will stay bonded unless oxidation takes place. Buried complexes are likely to experience reducing conditions and should remain stable (Personal communication, Jeff Austin, November 1990).

Molecular weight:	202.4
Specific gravity:	Not available
Melting point:	255-280° C
Solubility in water at 15° C:	> 30%

Toxicity: See the MSDS sheets in Permit Application for "Health Hazard Information". No information on toxicity to aquatic organisms was located.

Environmental Information: Xanthates contain potassium hydroxide (CAS No. 001310-58-3) which is subject to reporting requirements of SARA, Title III, Section 313 and 40 CFR 372 (American Cyanamid Company, 1990).

2. MIBC (methyl isobutyl carbinol or methyl amyl alcohol)

MIBC is a stable colorless liquid. It is only slightly soluble in water but is miscible in all proportions with most organic solvents. It is used to lower surface water tension for stable froth formation. The majority of the MIBC added to the flotation circuit would be found in the liquid phase of the ore concentrate stream. MIBC also will be adsorbed with

the xanthate on the mineral particle surfaces. MIBC biodegrades readily (State of Wisconsin, 1986).

Molecular weight:	102.17
Specific gravity:	0.8065 (20°/4°)
Boiling point:	131.8° C (760 mm Hg)
Freezing point:	-90° C

Solubility at 20° C:

- MIBC in water, 1.7% by weight
- water in MIBC, 5.8% by weight

Flash point (closed cup): 41° C

Toxicity: See the MSDS sheets in Permit Application for "Health Hazard Information". Tests performed on animals have shown that the toxicity of MIBC is comparable to that of normal butyl alcohol. (Ministry of the Environment, 1977). Toxicity to aquatic life is 100 to 1,00 mg/l (fathead minnows) (U.S. Department of Agriculture, 1984).

Environmental Information: This product does not contain any components regulated under SARA, Title III, Section 313 and 40 CGR 372 or other EPA regulations (American Cyanamid Company, 1990).

3. Percol 350 (Magnifloc 491C, Cyanamid equivalent)

These are synthetic polymers, composed of polyacrylamides, used as a flocculent. Flocculants usually remain attached to settled particles but various flocculants degrade at different rates. Initial breaking of the polymer chains occur rapidly but subsequent degradation occurs more slowly. A build-up of flocculants in recycled water usually is not a problem in metal mining operations (State of Wisconsin, 1986).

Chemical family:	cationic polyacrylamide
Molecular weight:	polymer
Specific gravity:	not applicable

Boiling point:	not applicable
Solubility in water:	limited by viscosity

Toxicity: See the MSDS sheets in Permit Application for "Health Hazard Information". Reported to be acutely toxic to fathead minnows at about 570 mg/l (U.S. Department of Agriculture, 1989).

Environmental Information: This product does not contain any components regulated under SARA, Title III, Section 313 and 40 CFR or other EPA regulations (American Cyanamid Company, 1990).

D. Comment: The projected water quality is erroneous.

Response: Mass Loading Analysis

1. Assumed Discharge Rate

The DEIS predicts that the water quality in Libby Creek at site LB-800 will exceed the selected beneficial use criteria for copper and manganese during Year 2 and 3 of construction, according to the discharge scenario referred to as "Following mine and adit water discharge" (DEIS Figure 4-2, Pg. 187). These exceedances are based on the loading calculations for copper and manganese presented in Table 6-11 (Pg. 319).

The discharge scenario leading to the predicted exceedances is predicated on the discharge to Libby Creek 0.87 cfs (392 gpm) of water produced in the three adits and 1.25 cfs (560 gpm) of water produced in the underground mine workings. Based on the expected copper and manganese content of these waters the DEIS uses a dilution model to estimate the resultant concentrations in Libby Creek.

The exceedances are predicted to occur only for the time period immediately prior to start-up of production and once the facility is in full operation the diversion of underground water to the mill alleviates the predicted exceedances.

The discharge scenario used to predict the exceedances relies on the assumption of 1.25 cfs (560 gpm) of water with an elevated copper content of 0.073 mg/l being produced from the underground mine workings immediately prior to start-up of production mining. This

assumption is incorrect and appears to be based on a misunderstanding as to the extent of underground workings which are in place prior to mill start-up.

No mining will be undertaken prior to the start-up of the mill facility for full production. Other than the three adits driven for access, conveyance, and ventilation there will be minimal underground workings, comprising the "mine", in place prior to start-up. These pre-production workings are limited to the immediate vicinity of the lower ends of the adits and contain the necessary infrastructure and initial access for the start-up of mining. Most of the pre-production development takes place in waste, not in the ore zone, and water quality could be expected to be similar to adit water quality.

Given the limited extent and depth of the pre-production "mine" workings, it is not reasonable to attribute a flow of 1.25 cfs into these workings. The method used to predict the inflow into the adits estimates an inflow rate of less than 1 gpm per 1000 linear feet of workings at the lower end of the adits. Using this inflow factor and the approximately 8000 linear feet of pre-production mine workings results in a flow contribution of approximately 0.018 cfs (8 gpm) instead of the 1.25 cfs (560 gpm) used in the DEIS analyses. Applying this mine flow rate to the dilution analyses result in the following concentrations in Libby Creek:

Concentration in Libby Creek at:

Parameter	8 gpm	560 gpm	Exceedance Criterion
Copper	<0.003 mg/l	<0.016 mg/l	0.003 mg/l
Manganese	<0.002 mg/l	<0.11 mg/l	0.05 mg/l

2. Conservative Assumptions

Pg. 316 of the DEIS states that the impact writers feel that the proposed analysis does not represent either a "worst case" or a "best case" scenario. We feel that this simplistic "loading" calculation represents a clear "worst case" analysis and that it is overly conservative.

The treatment of reported values below the detection limit as values at the detection limit is extremely conservative.

The analysis assumes dilution with the 7 day, 10 year low flow discharge in Libby Creek.

The analysis also assumes that Libby Creek in the vicinity of LB-800 and LB-2000 represents a gaining reach through all flow conditions. A review of the flow data collected during the collection of surface water quality samples suggests that this is not the case. For example, flow at LB-800 on 4/28/88 was 157.8 cfs while the flow at LB-2000 on 4/27/88 was 95.3 cfs. Conversely, on 8/17/88, the flow at station LB-800 was 7.3 cfs while the flow at LB-2000 on 8/17/88 was 9.8 cfs. This suggests that Libby Creek in the reach between LB-800 and LB-2000 may not experience significant groundwater inflows on continuous basis.

The analysis does not include any reduction in copper or manganese values due to dilution from present groundwater flux, dispersion of trace metals due to mechanical processes, or adsorption of metal ions on either soil particles or silts and clays within the saturated zone. The fact that these processes may be difficult to quantify in this setting does not preclude their discussion in the impact analysis. Since dilution, dispersion, and adsorption may result in significant reduction in the concentrations of copper and manganese reaching Libby Creek, the analysis is overly conservative.

Impact Analysis

The DEIS indicates that an exceedance of Montana's water quality standards would be realized should Noranda's proposed development be permitted. As noted above, exceedances are unlikely to occur. This impact analysis should focus on the expected changes in water quality as they relate to aquatic life and current beneficial uses of Libby Creek. A finding that no significant impacts to beneficial uses should be made based on this analysis.

Receiving Water

The loading calculations provided in the DEIS and the resultant exceedances are evaluated within the context of surface water standards. This follows the "worst case" analysis that was requested for the petition. Technically, the first receiving water for all points of discharge in Noranda's proposed plan is groundwater. Groundwater quality standards are based primarily on Drinking Water Standards. As such, the discharge of excess waters generated by the mining development should be analyzed for exceedance of groundwater which utilizes the following assumptions:

- Mine water - 1.25 cfs @ .073 mg/l copper concentration
- Adit water - 0.87 cfs @ .010 mg/l copper concentration
- Ambient groundwater - 0.46 cfs flux @ 0.0133 mg/l copper concentration

Resultant mine water/adit water copper concentration = 0.047 mg/l
Resultant mine water/adit water and groundwater copper concentration = 0.0141 mg/l.

The Montana groundwater quality standard for copper is 1.0 mg/l. Therefore, these calculations indicate that no violation of Montana's groundwater quality would occur.

E. Comment: Will tailings be toxic?

Response: Laboratory tests were conducted on representative samples of the tailings, Lower Revett, footwall, raw ore, and the barren zone to determine weak-acid extractable metals, total constituents, and acid-base potential (Tables 38-1, 38-2, and 38-3 in the Hard Rock Application). None of the rock types exhibited elevated leachable metal concentrations.

F. Comment: You can't plug mines.

Response: Groundwater

Data obtained on water inflow to underground workings during the operational phase will be utilized to predict whether or not the adits will have a long-term outflow of water and whether this water will meet state and federal quality standards. If it is determined that there may be post-operational problems with drainage from the project adits, then tunnel plugging will be considered. Tunnel plugging technology has been well developed. Design, construction and testing of underground plugs is well documented for the deep gold mines of South Africa where reasonably hard rock and high water pressures are experienced. In South Africa, plugs have been installed at pressures up to 1,400 psi with the residual leakage of less than 1 to 2 gpm (Steve Phillips, Grouting Consultant, February, 1989).

Design, location and installation techniques all are important for successful plugging. It is anticipated that rock conditions in the Montanore Project adits will be well suited for installation of plugs. Long sections of competent rock should be readily available in the adits. Water quality is good, and the installation of plugs should be relatively uncomplicated.

Plug Location

The choice of location of the plugs is important in determining the success of their application. Obviously, it is not always possible to find the perfect plug site, but there are some requirements which should be met where possible. In some cases, a deficiency in the available site, when compared with the perfect site, can be offset by a modification in the plug design. There is no generic plug design, and the basic design principles must be modified and adapted to suit the existing site conditions. One plug would be designed and installed for each adit that would have an outflow of water of undesirable quality.

For an optimum location the following criteria should be used to determine the site for a plug. Rock surrounding the plug site must be sufficiently strong and competent and free from geological problems (i e., faults, fracture system, dikes, weathering, etc.), and remote from highly stressed areas and other mined openings whether they are in existence or are planned for the future. The lithostatic stress at the plug site must be greater than the expected hydrostatic head, preferably by a factor of at least two. All other factors being equal, the plug should be constructed in the smallest cross-sectional area of the drift so the applied hydrostatic forces are minimized.

Conceptual Design and Type of Plug

The optimum plug type for the Noranda site is a parallel sided plug (Figure 44-1). Inherent in the design of parallel sided plugs are low contact stress along the concrete-rock interface and long seepage paths around the plug. This results in low hydraulic pressure gradients along the plug and therefore ease of sealing and maximum effectiveness of the plug as a water barrier.

Assuming the plug will be subjected to a maximum hydrostatic head of 800 ft or about 350 psi, and that the plug will be installed in a 22 ft by 22 ft drift opening, the surface weathering and deterioration of up to 6 inches from each wall, floor and roof would be removed by mechanical means (not blasting). The conceptual design indicates the plug length should be between 40 and 50 ft long.

Plug Materials and Construction Aspects

Concrete for the plug would be a high density, low permeability, concrete using Type V Portland cement with up to 30% cement replacement with P.F.A. (pulverized fuel ash). The P.F.A. is used to: (a) achieve good workability of the fluid concrete, (b) decrease the permeability of the set concrete, (c) reduce the amount of heat generated during setting, thereby reducing shrinkage and the possibility of shrinkage cracking, and (d) increase the resistance of the set concrete to chemical attack. Water to cement ratios would be kept low to achieve a dense, low permeability concrete and the additional workability required to allow the concrete to flow into the irregular surface of the rock will be achieved by use of plasticisers/water reducers. High concrete strengths are not necessary for parallel sided plugs, however to satisfy other requirements for the concrete (i.e., high density, low permeability, pumpable, etc.), a medium strength concrete would be achieved.

The concrete pour would probably have to be carried out in several stages so the temperature rise in the concrete due to hydration can be controlled and kept to within accepted tolerances. Pre-cooled water for concrete mixing may have to be used as an added precaution against excessive temperature rise in the concrete. The stages of the pour would be such that the cold joints would be orientated normal to the axis of the drift, thus they will not provide a leakage path directly through the plug from the wet end to the dry end.

At the completion of the pour, and after adequate time has elapsed for the concrete to gain strength, cool, and shrink, grout holes would be drilled through the concrete plug to the concrete rock interface. This joint would be grouted initially with cement grout to completely fill any voids or cracks which may exist at the interface and form a tight bond between the concrete and wall rock along and around its total length and perimeter. If further sealing is required, a low viscosity (approximately 1.3 centipoise), highly penetrable, chemical grout would be used to further reduce water flow along this contact zone.

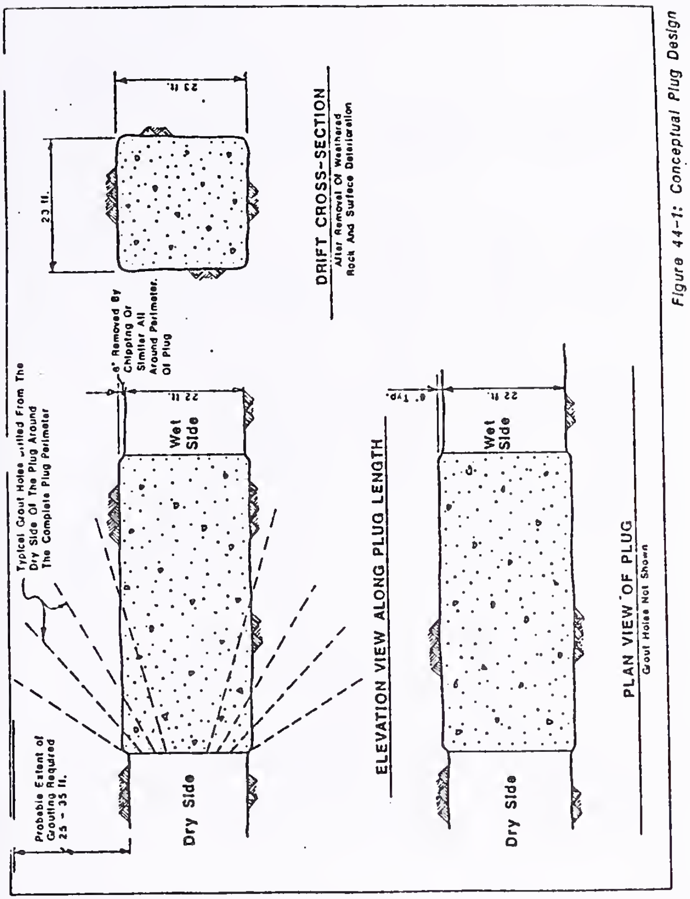
23 ft.
23 ft.
DRIFT CROSS-SECTION
After Removal Of Weathered Rock And Surface Deterioration
6" Removed By Chipping Or Similar All Around Perimeter Of Plug
22 ft.
Wet Side
Typical Grout Holes Drilled From The Dry Side Of The Plug Around The Complete Plug Perimeter
Probable Extent of Grouting Required 25 - 35 ft.
Dry Side
ELEVATION VIEW ALONG PLUG LENGTH
6" Typ.
22 ft.
Wet Side
Dry Side
PLAN VIEW OF PLUG
Grout Holes Not Shown

Figure 44-1: Conceptual Plug Design

After this area has been grouted, the holes, together with additional holes, if necessary, are extended out in stages into the surrounding rock. The rock is then grouted progressively out from the plug until the holes penetrate the rock peripheral to the drift that has not been subject to stress relief and relaxation or influenced by the presence of the mined opening. Grouting would be carried out with cement or chemical grout, as determined by the size of the fractures or other openings that have to be grouted, at pressures exceeding the expected hydrostatic pressure, but less than the lithostatic pressure at the plug site. In this way a zone of grouted rock is formed, probably extending, in this case, some 25 to 35 ft into the rock adjacent to the plug. The pressure grouting thus creates a state of confinement along the plug which increases the resistance of the plug to movement and to leakage. The Precambrian rocks penetrated by the adits at the Noranda site are expected to be both strong andcompetent and should provide sites quite suitable for plugs. Plugging is a proven technology for controlling water flows in adits and should be appropriate for this project.

6. Nicolas E. Oltean (0032)

A. Comment: Impacts to Wilderness

Response: The Wilderness Act Directs the Forest Service to protect the natural character of wilderness and to provide for recreational, scenic, scientific, educational, cultural, and historical uses of wilderness areas. Based on the Wilderness Act's definition of wilderness, the Forest Service describes four requisite attributes of wilderness as:

1) natural integrity;
2) apparent naturalness;
3) outstanding opportunities for solitude; and
4) opportunities for primitive recreation.

These attributes are applied to the conditions inside the boundaries of the wilderness. While the experience of wilderness visitors might be affected by activities outside the wilderness boundary, the Wilderness Act does not require that adverse affects associated with those activities be mitigated. Buffer zones for adverse effects are considered to be inside and not outside the wilderness boundary.

B. Comment: Water Quality Impacts

Response: The DEIS indicates that an exceedance of Montana's water quality standards would be realized should Noranda's proposed development be permitted. These exceedances are unlikely to occur. This impact analysis should focus on the expected changes in water quality as they relate to aquatic life and current beneficial uses of Libby Creek. A finding that no significant impacts to beneficial uses should be made based on this analysis.

The operational hydrologic and biologic monitoring will ensure performance of water management programs.

C. Comment: Wildlife Impacts

Response: Since gray wolf and woodland caribou are not reported to occur in the area, they are unlikely to be affected by mining activities. Canada lynx and wolverine are uncommon in the wildlife project area, and are unlikely to be significantly affected by mining activities.

Peregrine falcon and bald eagle are unlikely to be significantly affected by mining activities because they rarely enter the proposed mine area.

7. U.S.G.S. - J. Moreland (0035)

A. Comment: Given the varied metal content of waste rock, conditions which may be restrictive to dissolution of some metals may not be restrictive to others. Therefore, careful consideration of geochemical conditions for all phases of waste-rock handling for all depths of potential disposal and potential solute movement may be warranted to help avoid adverse effects to groundwater quality.

Response: Reference Hard Rock Application

Waste Rock Characteristics

The mining operation will generate waste rock while driving access, ventilation, and conveyor adits. Ore will be extracted from the quartzites of the upper part of the lower member of the Revett Formation, producing waste rock from the lower quartzite units of this member and from the zone that separates the copper/silver mineralized zones. Four

geologic formations have been identified as having the potential to be encountered by the adits. They are the Prichard, Burke, Revett, and Wallace Formations.

The Prichard Formation consists primarily of laminated argillite with interbeds of siltite. The Burke Formation consists of siltite interbedded with laminated argillite and silty argillite. The Revett is characterized by clean quartzites interbedded with siltite and silty quartzite. The Wallace Formation is characterized by interlaminated argillite and siltite interbedded with laminated limestone and laminated dolomitic quartzite.

No detailed chemical data exist on the Prichard, Burke, and Wallace Formations. Laboratory tests were conducted on representative samples of the tailings, Lower Revett, footwall, raw ore, and the barren zone to determine weak-acid extractable metals, total constituents, and acid-base potential (Tables 38-1, 38-2, and 38-3 in the Hard Rock Application).

None of the rock types exhibited elevated leachable metal concentrations. Whole rock analyses indicate all rock types have elevated levels ofchromium and all have elevated levels of copper with the exception of the barren zone rock type.

Because no detailed analyses exist on the geological formations to be encountered by the adits, the Montana Project will monitor the waste rock that is produced. If some rock exhibits an acid generation problem, then the material will be separated from the other waste rock as it is removed from the adit. A detailed plan for the handling of this waste rock will be determined in conjunction with MDSL. The probability of encountering acid generating materials in the adits is anticipated to be very low.

8. P. Lesica (0046)

A. Comment: Until 1989 there were only two known sites for northern beech fern, Thelypteris phegopteris, in Montana and the Northern Rocky Mountains. Both of these sites are in Glacier National Park. I have relocated one of these populations, and it has fewer than 100 individuals. In 1989 Joe Elliott located a population of this rare fern along Little Cherry Creek in the Cabinet Mountains. Dr. Elliott told me that this population was very large, with over 1000 plants. He also said that, in spite of extensive

TABLE 38-1R. WEAK-ACID METALS EXTRACTABLE ANALYSIS FOR VARIOUS ROCK TYPES *

(mg/l in extract)

Parameter	As	Ba	Cd	Cr	Pb	Hg	Se	Ag	Cu
Tailings	<0.004	0.4	<0.01	<0.02	0.13	<0.01	<0.025	<0.01	0.25
Lower Revett	<0.004	0.3	<0.01	<0.02	0.09	<0.01	<0.025	<0.01	0.06
Foot Wall	<0.004	0.1	<0.01	<0.02	0.05	<0.01	<0.025	<0.01	0.04
Raw Ore	<0.004	0.4	<0.01	<0.04	0.26	<0.01	<0.025	<0.01	1.4
Barren Zone	<0.004	<0.1	<0.01	<0.02	0.64	<0.01	<0.025	<0.01	0.05

* TCLP Method (40 CFR Part 268 Appendix 1)

TABLE 38-2R. WHOLE ROCK ANALYSIS FOR VARIOUS ROCK TYPES *

parts per million

Parameter	Tailings	Lower Revett	Foot Wall	Raw Ore	Barren Zone
K	19300	19800	34700	19200	13600
Na	9770	11600	10400	9860	14400
Ca	2040	1640	1540	2060	6560
Mg	2100	980	9300	2130	760
As	7	7	10	7	7
Al	35000	32900	64600	35300	29500
Ba	520	720	740	520	440
Be	<5	<5	7	<5	<5
Cd	<5	<5	<5	<5	<5
Cr	115	40	68	55	60
Cu	330	19	93	7880	7
Co	8	<5	14	8	<5
Fe	7230	3500	23200	8160	2630
Pb	<5	<5	<5	50	350
Mn	280	215	500	310	640
Hg	<5	<5	<5	<5	<5
Mo	8	<5	5	8	5
Ni	61	30	46	36	43
Se	<5	<5	<5	<5	<5
Ag	7	12	8	66	5
Sb	<5	--	<5	<5	<5
Zn	13	--	140	22	13

* Alkali fusion method (ASTM D 3682)

TABLE 38-3R. ACID-BASE POTENTIAL FOR VARIOUS ROCK TYPES 1)

Rock Type	Neutralization Potential (ppt)2	Acid Potential (meq/100 gm)	Acid-Base Potential (ppt)2)
Tailings	8	<1	+8
Lower Revett	6	<1	+6
Foot Wall	8	<1	+8
Raw Ore	9	24	-3
Barren Zone	22	9	+18

1) American Society of Agronomy; Monograph #9, Method 28-2.2.3 and 23C

2) Tons $CaCO_3$/1000 tons dry material

"+" = Lime excess; "-" = Lime deficiency

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searching in the adjacent drainages, this was the only population he found that was larger than a few plants.

Peripheral populations may contain unique gene complexes and can be very important in terms of conservation of genetic resources. The Little Cherry Creek population of Thelypteris phegopteris, because of its size and the regional rarity of the species, is a significant resource. This population will be destroyed under the current plans outlined in the EIS.

The EIS mentions this rare plant in one paragraph on pare 221. There is no real mention of the significance of this population. There is also no mention of mitigation. I feel the treatment of this problem is inadequate. On December 11 there will be a meeting of hotanists from around Montana and northern Idaho in Missoula to revise the list of sensitiveplant species for Region One. I suspect that Thelpteris phegopteris will be added to the list at this time.

Response: Joe Elliott reviewed Peter Lesica's letter concerning the potential impact of the Montanore Project on the northern beach fern. Lesica initially contacted Joe Elliott concerning this fern when he saw that it was listed in the baseline vegetation report prepared by Western Resource Developement Corporation. He expressed doubts that it was identified correctly. According to Western Resource Development Corporation's Plan of Study, any rare or unusual plants would be verified by personnel at the University of Montana herbarium. Therefore, a specimen of this plant was sent to Lesica for verification. He is widely recognized as the foremost authority of rare plants in Montana.

Following his verification, he then contacted Joe Elliott concerning the size of the population on Little Cherry Creek. Joe Elliott assisted Western Resource Development Corporation in their field studies and made all plant identifications for the Montanore Project. Joe Elliott informed Lesica that the population was relatively large with perhaps 1,000 individuals. Joe Elliott also told him that he found other plants in the Bear Creek drainage.

As a result of Joe Elliott's field studies in and around the Montanore Project area, he had the opportunity to search widely for this species in suitable habitat. Joe Elliott found it only along Little Cherry Creek and Bear Creek. It is definitely rare in the area; however, additional field seachers could turn up more plants.

Although the plant is rare in Montana, it is a relatively common circumboreal species in North America. The Montanore Project would have no effect on the species as a whole.

9. Libby Placer Mining Co. - J. Cleveland (0051)

A. Comment: The Little Cherry Tailings site is flawed technically. The Forest Service and the State must demand that Noranda investigate alternative methods of tailings disposal. It may be necessary to postpone development until these more sound tailings disposal methods become economic. The Agencies must do the right thing and reject the proposed Little Cherry tailings disposal site.

Response: Previous and on-going geotechnical investigations of the Little Cherry site have not revealed any technical flaws at the site which would preclude the construction of a stable facility. (ref: MKE - Interum Tailings Impoundment Engineering Report, July 1990 - Addendum to Geotechnical Report, November 1990).

Alternative tailings disposal methods are discussed in the DEIS (Tailings Disposal Techniques, Pg. 83). These techniques are not appropriate to this project.

B. Comment: Alternative 6 is clearly the most desirable. This alternative involves less overall erosional impact, fewer roads, significantly less wildlife impact and less scenic impact.

Response: Alternative 6 would have the most impact on private lands other than those of Champion. Noranda would support Alternative 5 which would reduce impacts to wildlife and visual impacts (ref: DEIS, Power Engineers).

C. Comment: At a minimum, the mitigation package proposed by the Agencies (Alternative 2) must be implemented. What additional measures, over and above those presented in the Draft, will be implemented to handle the high level of impact on wildlife during the construction phase? Can the cumulative impacts of both Noranda's and ASARACO's project be mitigated? Perhaps a "no-hunting" corridor should be set up along the new road route and similar "no-hunting" zones be established around the

proposed plant facilities. Plowing the Libby Creek road will only increase impacts on the area and should not be permitted.

Response: The mitigation plan as proposed by the Agencies does not address habitat security, mortality, or population augmentation (ref: Noranda Comment, December 1990).

Any mitigation plan approved will address impacts for the entire project schedule including construction.

The cumulative impacts of the ASARCO project will be weighed at the time of that project's DEIS compilation (ref: DEIS).

"No-Hunting" corridors would have to be established by the Montana Fish & Game Commission.

Noranda has not propsed the plowing of the Libby Creek road for recreation mitigation.

D. Comment: Noranda must be required to minimize the impact of its proposed mining operation on existing water quality through the construction of water treatment facilities. Who will continue to monitor water after mine closure?

Response: The need for water treatment has not been demonstrated as there are no projected impacts to current or future groundwater or surface water uses.

The treatment technology alluded to in the DEIS has not been demonstrated on a commercial scale to be applicable for the removal of the low levels of metals that are projected for the project effluent.

Noranda has indicated in the Hard Rock Application that it would continue monitoring during reclamation/post reclamation activities until the agencies were assured that reclamation was successful.

E. Comment: Artesian pressures will lead to dam instability and cause its failure.

Response: Noranda's engineers will design the pressure relief system to insure dam stability (ref: MKE "Conceptual Design Pressure Relief System", November 1990).

F. Comment: The Draft is deficient in its discussion of reclamation. Drying time for the tailings is variably estimated at "several months to several decades". Who will be responsible for inspecting and maintaining the adit plugs to be placed upon cessation of mining activities? Where will the water flows or seeps from abandoned mine workings go? What will the quality of this water be?

Response: The agencies have determined that the reclamation proposal is adequate in their "letter of completeness" of November 17, 1989.

Dewatering of the tailings will be completed by placement of the reclamation cover (i.e., surcharging) within the 2 years indicated in the reclamation schedule.

If the agencies determine that mine water quality requires bulkheads in the adits, the bulkheads would be so constructed as to eliminate discharge. Noranda would conduct the post-reclamation inspection.

G. Comment: The Draft states that noise would be constantly generated by ventilation fans.

Response: The permanent vent fan installations would be located underground, and no noise attenuation will be required.

H. Comment: The Draft states that the barren zone waste rock could generate acid mine drainage.

Response: Noranda has submitted a plan for monitoring waste rock in the Hard Rock Application.

I. Comment: The Draft reflects considerable doubt about the Project water balance. The Agencies can assume that water inflows will be considerably higher than initially projected.

Response: The agencies have concurred with the water balance as presented. Noranda has also prepared a contingency water management program.

10. Libby Placer Mining Co. - D. Cleveland (0052)

A. Comment: Noranda is obligated by law to reclaim the land it disturbs. The plan they propose will clearly not meet this obligation.

Response: The proposed reclamation plan was approved by the agencies in their "letter of completeness" of November 17, 1989.

B. Comment: There is no evidence of artesians at the Midas Creek site. There would be no need for the installation of pressure relief wells. There would be no concern over dam failure due to pore water pressures. Furthermore, the Draft DEIS states that there would be lesser rates of seepage at the Midas site due to less permeable soils (DEIS, Pg. 79). The Midas Creek site has the same storage capacity as the Little Cherry site, and it would have far less visual impact on the area (DEIS, Pg. 78). The DEIS fails to adequately examine the suitability of the Midas Creek drainage as an alternative to the Little Cherry site. Given the known instability of the Little Cherry site, the Forest Service should fully re-examine the viability of the Midas Creek site.

Response: The assumption that the Midas Creek site would be more suitable than Little Cherry Creek is erroneous as the geotechnical investigation of that site was too limited to support the above assertions. The investigation was discontinued when the post-reclamation reliability of the diversions was estimated as poor.

The Midas site does not merit further investigation.

C. Comment: The proposed plant location, is adjacent to the Ramsey Lake wetlands habitat. Mine facilities will necessarily disturb and displace habitat. Further study of alternative plant sites downstream of the proposed site on Ramsey Creek is clearly warranted.

Response: The proposed plant location will not disturb any wetlands.

D. Comment: The DEIS describes water and wildlife monitoring plans and routing alternatives for power transmission line which occur on or cross the private property of the Libby Placer Mining Co. (LPMC).

Response: This comment is not true.

11. Flathead Electric Cooperative Inc. (FECI) - W. McConkey (0082)

A. Comment: Noranda advised us that we were the preferred utility. Noranda has proposed to design, build, and own the facilities itself. It must be understood that the Bonneville Power Administration (BPA) itself cannot by law construct or serve the mine directly. It must be understood that BPA cannot serve or fund construction of the transmission line or substations. They discount the use of 115 KV transmission. We concur that the area is rich in minerals and other resources that will likely involve other future mining and industrial developments in the project area.

Response: Noranda has not notified FECI that they were the preferred utility. Noranda is still discussing proposals with the 5 utilities that it considers able and eligible to serve the Montanore load.

Noranda considers ownership of the transmission line an option for the project at this time. Noranda is aware that it is not eligible to be a direct customer of BPA. Noranda is familiar with areas where BPA does own and operate tap stations.

Noranda's Application for Transmission Line License is for service to the Montanore Project singularly as there are no other known connected developments planned which would benefit from this construction. As such, the proposal for 230 KV construction is the environmentally sound alternative.

The comments of FECI may have been more properly reserved for contractual discussions.

12. United States Environmental Protection Agency (USEPA) - (0085)

A. Comment: Special Aquatic Sites: No information was provided in the DEIS concerning documented wetlands delineation/evaluation.

Response: In the Application for Hard Rock Operating Permit, Noranda has provided delineation of wetlands in all areas to be impacted by project components (Appendix E). Noranda has also submitted supplemental data to the Agencies regarding wetlands in the tailings impoundment area (Western Resource, November 1990).

B. Comment: The DEIS fails to address from an alternatives and impact analysis perspective the requirements of the Clean Water Act, section 301, Section 404 (b)(1) Guidelines 230 1 (a), (b), (c), and (d).

Response: Noranda has provided a discussion of alternatives in the geotechnical reports of Morrison-Knudson Engineers.

Noranda is providing the attached discussion of its investigations of economic potential at the Little Cherry site.

C. Comment: Water Quality: Further documentation will be necessary for an adequate assessment of potential water quality impacts.

Response: Noranda has provided adequate documentation in the Hard Rock Application, in the Petition to BHES, and in DEIS comments.

D. Comment: Catastrophic Adverse Environmental Impacts: The DEIS does not address the adverse environmental impacts which would result should subsidence to the surface occur either during or post-closure of the mine.

Response: Noranda has provided the Agencies the geotechnical evaluation and conceptual rock mechanics design (Call & Nicolas, 1989), for the prevention of subsidence.

E. Comment: Avoidable Impacts: The DEIS does not include analysis of alternatives which would avoid or reduce impacts to aquatic sites (i.e., backfill of mine).

Response: DEIS at Pg 83.

F. Comment: Air Quality: Noranda's application for the Air Quality Permit to DHES provides the basis for determination that the project is not expected to emit criteria pollutants in excess of regulatory limits and no emissions will violate standards for Class II areas (ref. EPA comment).

13. Association of Forest Service Employees for Environmental Ethics - D. Kern (0086)

A. Comment: Noranda has no legal claim to ore body.

Response: Refer to letter addressed to U.S.F.S./DSL dated January 9,1991.

B. Comment: Each involved agency must prepare EIS.

Response: DEIS, Chapter 1, Pg. 1.

C. Comment: DEIS failed to provide a Biological Assessment.

Response: DEIS, Chapter 1, Pg. 4.

D. Comment: The Petition for Change in Ambient Water Quality does not demonstrate maintenance of current and future beneficial uses. The proposed impoundment site is not suitable for stable dam construction.

Response: The maintenance of beneficial uses will be monitored. Noranda has demonstrated the suitability of the Little Cherry site for operation and reclamation.

E. Comment: The project will have significant impacts to recreation, wilderness, and socio-economics.

Response: The environmental analysis has not determined these significant effects. The Cabinet Mountain Wilderness has internal buffer zones.

14. Libby Placer Mining Co. - D. Cleveland (0087)

A. Comment: The Forest Service neglected to discuss the impact of wetlands water treatment on wildlife in the DEIS. This is a critical consideration in selecting a water treatment plan. The Forest Service discussion of this alternative in the DEIS is therefore deficient. The impact of wetlands water treatment on wildlife habitat must be examined in order to assess the most environmentally responsible water treatment program.

Response: The major removal mechanisms for the metals of concern appear to be precipitation of the metals as sulfides in the anaerobic zone and ion exchange in the organic matter. Plant uptake of metals is not significant (CDM, December 1990).

15. Libby Area Chamber of Commerce - C. Wood (0092)

A. Comment: We further suggest that a "Community Interest" board consisting of Lincoln County Commissioners, Chamber of Commerce, and other special interest groups be established to provide a communication conduit between the community, the agencies involved, and Noranda to review monitoring results, mitigation, and related issues when appropriate.

Response: The "Hard Rock Impact Plan" as submitted by Noranda (December, 1990) proposes the establishment of an "Oversight Committee" to review the socio-economic status.

16. Pacific Power - R. Moench (0093)

A. Comment: The existing job losses due to the closure of the W.R. Grace vermiculite mine, coupled with the projected loss of jobs in the wood products industry will have a substantial negative impact on the local and state economies. The development and operation of the proposed Montanore mine will partially offset these negative economic impacts and improve economic diversification.

Response: At the time of NMC's survey of the existing socio-economic baseline, this data was not available.

17. Cabinet Resource Group - J. Davies (0102)

A. Comment: Water Quality Issues

Response: The accusations that NMC has submitted falsified data are without foundation and not accurate, and these comments should not be addressed as part of the analysis process. The Board cannot grant exemption to water quality standards.

18. Charles Sheroke (0108)

A. **Comment:** The Habitat Effectiveness Computer model (Cumulative Effects Analysis Process for the Selkirk/Cabinet - Yaak Grizzly Bear) provides only a hypothetical index which is not good at predicting indirect impacts requiring in such instances a full disclosure of unavailable or incomplete data and an evaluation of "reasonably foreseeable" impacts which have catastrophic consequences, even if their probability is low.

Response: The CEM model has not been used previously for determination of project impacts.

19. W. Kasworm (0117)

A. **Comment:** While construction of this mine does not have my support, I recognize that it may be permitted by the agencies. If this permitting occurs, I support the following compensatory measures:

1) Wilderness integrity and naturalness - Alternative 2;

2) Forest Recreation - Alternative 2 with thorough evaluation of alternative main access using road 231 rather than road 278. I also support the busing program;

3) Water quality and quantity - Alternative 3 with wetlands water treatment of tailings seepage. I support increased water quality monitoring with agencies or a third party doing the monitoring. Mining should not occur within 200 feet of the fault or 750 feet of Rock Lake;

4) Fish and wildlife - Alternative 2, 3 and 6 do not appear to be mutually exclusive. I have had problems with this document understanding the "alternative scheme". The alternatives are not mutually exclusive as is typical in an EIS. I support habitat compensation, education, and law enforcement from 2, wetlands water treatment in 3, and powerline placement in 6 with helicopter stringing of lines. I support road closures that would bring USFS management promptly in line with the Forest Plan. I support metal concentration monitoring in fish populations.

5) Threatened and Endangered species - Alternative 2 is preferable with a management committee that has a Noranda representative to keep the company informed and involved with the management process. I specifically support the yearlong closure of the Bear Creek road.

Response: The writer does not indicate why he supports these compensation measures. It seems surprising that he is against project development as the references that he cites in his comments are supported by project contributions.

20. Kootenai Tribe of Idaho - R. Abraham (0121)

A. **Comment:** This proposal has the potential to affect the Treaty Rights of the Kootenai Tribe of Idaho in severe, negative ways over many decades.

Response: The proposal will not conflict with any existing rights or uses of the Kootenai Forest.

21. Cabinet Resource Group - M. Ferrel (0126)

A. **Comment:** Worker Safety and Health: The EIS needs to address worker safety and health as requirements of the permit. It should not be left to OSHA alone to monitor this critical area. Unless certain standards are met, the permit should not be granted.

Response: Mine safety is a responsibility of MSHA and not the Metals Mine Reclamation Act.

22. Lincoln Conservation District - J. Beebe (0127)

A. **Comment:** The Lincoln Conservation District feels that the EIS must address the affects of this project on Libby Creek during peak flows. Please address the reach of Libby Creek from Crazyman Creek to the Kootenai River.

Response: All diversions and sediment control will be designed to the 24 hour - 100 year storm for complete sediment control. The Forest Service Handbook and the State of Montana Resource Extraction BMP will be utilized for

the control of erosion and sedimentation (Hard Rock Application, Pg. II-117).

23. C. Jones (0128)

A. **Comment:** I propose the two additional alternatives be analyzed in order to explore a range of potential impacts to the five issues listed above, as well as the sixth - water quality. These two alternatives would permit an operation based on 5-10,000 tons of ore processed per day. One alternative would involve scaling down the facilities to achieve the lower production level; the other would involve operating the planned facilities for only 8-10 hours per day.

Response: The 20,000 ton per day proposal has no significant impact and a reduction in the level of production offers no mitigation.

24. Clark Fork Coalition - B. Farling (0130)

A. **Comment:** Tailings water quality is based on an analysis of ASARCO's Troy project (Table 6-8). If this is directly comparable, then you have to conclude the Troy mine is mining in the same ore body, one that has a large barren zone of lead sulfides. We are not sure that's the case. It appears Noranda's wastes may contain more sulfides, and therefore it's reasonable to assume its tailings pond water will be of a lower quality.

Response: The assumptions that the wastes contain more sulfides and that tailings water quality will be poorer are unfounded and not correct.

25. Cabinet Resource Group - B. Martin (0137)

A. **Comment:** At the very beginning of the EIS process for both ASARCO's Rock Creek and Noranda's proposals, we asked that socio-economics issues be addressed by studying what the effects of the ASARCO Troy project have actually been, rather than using hypothetical data statistically derived from dissimilar communities in other parts of the state or country. I reiterated this request at the scoping meeting for Noranda, bringing to the Agencies' attention, yet again, that a dramatic rise in the unemployment rate at the beginning of construction had occurred in Lincoln County in connection with Libby Dam and the ASARCO Troy

project. Others at the scoping meeting, not members of CRG, also voiced support for assessing the actual impacts of the Troy mine as a basis for making projections about the impacts of the Montanore mine and the Rock Creek proposal.

Response: There is no accurate data base reflecting levels of secondary employment or speculative in-mitigation from other mine developments. There is no way to survey for this data.

26. Tellavector Pacific - D. Barrie (0141)

A. **Comment:** To substantially reduce the size and volume of any tailings-waste rock disposal site(s) all excavated underground openings must be backfilled with mined-processed tailings materials. To develop and utilize all ore reserves roof support pillars within the ore body must be safely, progressively removed for processing; a mine method easily accomplished by use of formed concrete backfill cells sequentially packed with dewatered tailing fines and slimes injected under pressure, coupled with vibratory density enhancement. Coarse fractions would be incorporated in concrete slurries. Such replacement of tailings material within the rooms, stopes and tunnels will eliminate 85-87% of otherwise surface disposed tailings.

To improve underground and backfill operating efficiencies and to reduce surface disturbances by locating all ore processing equipment-facilities (mobile crusher(s) stationary mill, concentrator and transportation systems) underground, cast engineered, sub-super level, block-patterned chambers and utility-transport corridors must be constructed underground. Again, this is probably best accomplished by concrete cell casting techniques.

Through creation of an additional approximately 50 million tons of probable ore reserves (by utilization of roof support pillars) possessing an estimated gross value greater than $1.2 billion the costs of this TPL proposed increase in underground activity, including the cost of cement, can be amortized over a greatly enlarged capital base, mine life and gross revenues. None the less, economic parameters are here likely to drive choice of ultimate extraction, processing, disposal, and reclamation methods. We cannot, for lack of meaningful, project specific, economic/financial information properly analyze the economic impacts and profitability of our alternative underground backfill proposal at this time.

Response: For the geometry of the Montanore deposit, backfill would not offer adequate support to prevent collapse of the mine openings. Underground construction and operation of the grinding and milling facilities would require significant changes in ventilation requirements. Refer to Redpath report dated February 1991 for discussion of mine plan and orebody characteristics. This comment appears to be a sales pitch for unproven technology and is not relevent to this mine.

27. C. Mills (0144)

A. Comment: We believe that the pollution proposed by Noranda requires an NPDES permit or its Montana equivalent, updated and modified as set forth herein.

Response: The project has not proposed a discharge to surface water requiring an MPDES.

28. Confederated Salish and Kootenai Tribes - M. Pablo (0146)

A. Comment: It is our opinion that Noranda's proposal, Alternative 1, is unacceptable in light of the resources at risk and the availability of preferred options. Alternative 1 falls far short of a "good faith" effort to protect the environment both in its operational plan and its omission of important and proven remedial measures. In light of the resources at risk, the baseline objective should require that the mine and impoundment discharges be minimized to the maximum extent practicable. Because tailings water can be reused in the milling process, it is unreasonable to allow any recoverable water in the tailings impoundment to be released into the environment. Releases should only be an option when the process generates water excess to its needs, and then the releases should be of high quality. The plan proposes to use "clean" mine water as make-up water while simultaneously allowing contaminated tailings water to seep from the impoundment into the ground water. We feel this is a flawed plan, and thereby propose the remedial measures described in Alternative 3 as the only acceptable option (other than Alternative 7).

Response: The project proposed includes recycle of process water, pressure-relief well water (including intercepted seepage), and tailings decant water. Mine water is used for make-up as required.

Noranda has described the uses of water interceptions in its application for a water right to DNRC.

29. Cabinet Resource Group - C. Hernandez (0147)

A. Comment: The Cabinet Mountains Wilderness Area is a designated Class I airshed; degradation not allowed. The ore body proposed for development is approximately 3 miles within the wilderness boundary, yet no further discussion in the DEIS occasions the possibility that subsurface air must also be maintained in that pristine state. Wilderness is not just a surface property, just as surface mineralization does not preclude apexing an ore body along its subsurface depth.

Response: The application for the Air Quality permit included modelling for potential impacts to the Wilderness airshed.

30. American Fisheries Society - J. DosSantos (0161)

A. Comment: Noranda's proposal, Alternative 1, is unacceptable in light of the resources at risk and the availability of preferred options. Alternative 1 falls far short of a "good faith" effort to protect the environment both in its operational plan and its omission of important and proven remedial measures. The critical baseline objective should be that all mine and impoundment discharges be minimized to every extent practicable. Given that tailings water can be reused in the milling process, it is unreasonable to allow any recoverable water in the tailings impoundment to be released into the environment. The plan proposes to use "clean" mine water as make-up water while simultaneously allowing contaminated tailings water to seep from the impoundment into the ground water. Releases should only be an option when the process generates water in excess to its needs, and then the process generates water in excess to its needs, and then the releases should be of high quality. We feel this is a major flaw in the plan, and thereby propose the remedial measures described in Alternative 3 as the only acceptable option short of Alternative 7.

It was unfortunate that the options of clay or synthetic lining for the tailings impoundment were dismissed in the DEIS. Therefore, the only other remaining acceptable means of minimizing seepage is a gravel drain system. The construction of this type of drain system is complicated and will perform to stated specifications only when installed correctly. Consequently, there must be adequate monitoring and quality control inspections before this option is employed. The system of gravel drains to control seepage is also only sensible if the recovered water is treated before discharge. The wetlands method may be the most desirable due to the fact that it is essentially self-regulating, which would be a great asset during the timeless post-operational phase. However the risks of contamination to wildlife using the wetland, and the ultimate fate of metals-saturated plants removed from the wetland must also be addressed.

Response: The proposal maximizes the recycle of process water. Lining of the impoundment or construction of gravel drains would be no more effective in intercepting seepage than the pressure-relief system, but those methods could complicate or delay reclamation.

31. John Parker (0163)

A. Comment: Need to conduct extensive macroinvertibrate bioassy work including baseline bioassay over several years.

Response: No objectives of the monitoring or discussion of how this information would be used is presented in the comment. It is questionable if standard bioassay monitoring procedures (ie. Daphnia magna or fathead minnow) could be effectively employed or interpreted for these waters.

32. Kootenal Wildlands Alliance (0164)

A. Comment: Projected calculations for surface and groundwater pollution are being based on existing data from the Troy project. Serious questions have been raised as to the accuracy of the data from the Troy project and these questions have been dismissed to date. What assurances will be made in the final EIS that the data is accurate when based on the existing data which currently lacks proper credibility?

Response: Noranda is not aware of any problems with the accuracy of the water quality data from the Troy project. The Troy analyses have been conducted by EPA approved laboratories, including the DHES lab. The Montana DSL and DHES have extensively reviewed the Troy data and there are no reasons to question the accuracy of the data.

B. Comment: Given the relatively short time span given to collect baseline data, what provisions are being used to calculate annual and seasonal variations in groundwater and surface water contamination due to temperature and precipitation changes from year to year? What provisions allow us to make the assumption that the baseline data will reflect levels of contamination during typical years? Further what would the levels of contamination be during atypical years where extreme variations in climate may occur; such as 100 year floods, or drought?

Response: The analysis of water quality impacts as presented in the DEIS and in Noranda's Petition for Change in Quality of Ambient Waters includes both average and severe low-flow conditions. Use of the 10-year/7-day low flow is required by the Montana water quality regulations and is a standard procedure for evaluating water quality impacts.

C. Comment: Other methods of treating tailings currently exist. We do not believe safer methods of treating tailings have been adequately explored or addressed. Reasons for not hardening the tailings and returning them to the mine have not been adequately explained in the draft EIS.

This method would permit operation of the mine without the need of condeming existing claims or destroying valuable moose, elk and deer winter range which occurs at the tailings pond site.

Further, hardening and returning tailings to the mine would decrease surface area of mine waste, contain it more effectively, and reduce the levels of contamination which will occur.

Response: The contention that mine backfill of tailings would not require surface disposal of tailings and thus preclude the condemnation of the claims in the impoundment area and impacts wildlife habitat is in error. (See Redpath Report, February 1991.)

D. Comment: What downstream baseline data will be available for environmentally vulnerable areas before construction of the project? Areas of extremely slow moving water such as the Creston Wildlife Refuge exist downstream.

As much as 4000 lbs. of lead and other contaminates would be present and could settle out of the water each year as water decreases its rate of flow at such points. What provisions will be made to obtain baseline data for such areas? More importantly, what assurances can be made that such downstream contamination will not occur?

Response: The contention that lead which may be present as total recoverable in adit discharge or tailings impoundment water would reach the stream and settle out is not substantiated. Impacts to the surface water via the proposed groundwater discharge would reach Libby Creek as dissolved constituents. This concept is correctly shown in Tables 6-6, 6-7 and 6-8 of the DEIS.

E. Comment: Socio-economic factors such as unemployment rates should be addressed in the final EIS. Propaganda at hearings in Libby indicated that high unemployment would continue to exist if the Noranda project were delayed. Such assuptions run contrary to available data which shows that unemployment has risen during similar construction projects such as the Troy project and the Libby Dam. How would such rises in unemployment be handled during the construction of the project?

Response: There is no available data that indicates unemployment has risen during similar construction projects such as the Troy mine and Libby Dam. Unemployment data must be analyzed in context of other economic influences; the contention that adding 400 plus jobs to the Libby area economy will increase unemployment is not defensible.

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February 4, 1992

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Re: Noranda Minerals Corps.'s Responses to Public Comments to the Montanore SDEIS.

Dear Sandi and Bob:

As indicated in our letter of December 20, 1991, Noranda Minerals Corp. is providing responses to public comment received to the Montanore SDEIS

Thank you for your attention to this matter.

Respectfully,

Noranda Minerals Corp.
for
Montanore

Joseph A. Scheuering
General Manager - Development

js/

cc: Mark Petersmeyer
Doug Parker

cc, FS Team

Montanore Project - Supplement to DEIS

Responses to Public Comment

No.182-Matt Sanger-Grizzly Bear Recovery Plan

The Grizzly Bear Recovery Plan has not indicated that habitat is a limiting factor to the recovery of grizzly bears in the Cabinet-Yaak ecosystem. The recovery plan in fact focuses on augmentation of the current (1?) grizzly bear population and additional law enforcement and public education. According to Idaho and Montana grizzly bear researchers (S.Knick and W.Kasworm,1989,Wildlife Society Bulletin 17(1):11-14), grizzly mortality from illegal shooting during the hunting season is the primary cause of grizzly bear mortality in the Selkirk and Cabinet-Yaak mountains. The Noranda proposal emphasizes law enforcement and public education at a level substantially greater than now provided.

No.192-IDHEW DEQ-Sediment,Acid Rock Drainage,Catastrophic Events

The writer has apparently not read the BMPs and the monitoring proposed by the project for implementation during plant and powerline construction to control discharge of sediment to the creeks, as the suggestions of this comment are in the proposal.

The comment suggests that water treatment technology is available to treat project discharges to levels below background water quality. The writer apparently has not read the document thoroughly such that he understands background or the proposed efficiency of the technology discussed. Furthermore, there is no data to support a concern for acid rock drainage, particularly in review of the Troy Mine history.

The project proposal includes the use of the Bear Creek Road for access, not the Libby Creek Road, and requires only one crossing of Bear Creek. Noranda has included an emergency prevention and contingency plan in the project proposal.

No.201-Libby Placer Mining Co.
PowerLineRoute,Wetlands,WaterQuality,WildlifeMitigation,Tailings Disposal,ClaimValidity

Until the issuance of the SDEIS, the agencies had not identified a preferred routing for the powerline. The alternatives analysis in the DEIS indicated equivalent impacts for all alternatives. The SDEIS indicates that the comparison of the Fisher River crossings led to the selection of the North Miller Creek route.

The area designated in the upper Cherry Creek areas as a 'missing wetland" is not correctly mapped. The channel of the drainage has been identified by

Noranda as Waters of the United States, but the adjacent area is not a jurisdictional wetland. The "missing wetland" as mapped by the commenter includes a 80 to 120 feet change in elevation, from the drainage channel up confining slopes. Wetlands in the project area typically occur on gently sloping areas or flats.

The project proposal for wetlands mitigation is based on the functions and values of the areas impacted and of adjacent areas, which are the scientific criteria specified by regulation (not an arbitrary mathematical ratio). The commenter's suggestion to "restore" rather than construct new wetlands does not consider that wetland "restoration" on the project site would potentially change one type of wetland to another type of wetland. Areas such as Standard Lake and other sites dominated by sedges and other graminoids (i.e. wet meadows) have functions and values for certain types of wildlife, whereas "restored" (i.e. excavated) wetlands would provide other, but not necessarily preferable, wildlife values. A highly productive wet meadow such as Standard Lake provides breeding habitat for amphibians and reptiles in the spring when it is flooded and provides succulent forage throughout the summer when adjacent upland vegetation is dessicated. "Restoring" would result in better waterfowl breeding and resting habitat, but would reduce habitat values for species utilizing wet meadow habitats. Restoration of wetlands cited by the commenter from the New York Times referred to restoration of wetlands that had been drained for agricultural or other dryland uses and not conversion of one type of wetland into another type of wetland.

Creation of wetlands on the project site appears to be very feasible. Wetlands have been inadvertently created on some sites where logging activities have excavated shallow depressions or left deep wheel ruts. Soils and precipitation of the Noranda project area are suitable for wetland creation. In addition, the presence of groundwater under a hydrostatic head allows for artesian wells to be utilized as a source of water for wetlands.

The success for Noranda's proposed wetlands creation would be evaluated based on how closely functions and values of created wetlands compare with functions and values of disturbed wetlands. Functions and values of existing wetlands would be relatively easy to recreate as compared with recreating functions and values complex wetlands such as tidal estuaries, prairie potholes, bogs, or forested wetlands.

Neither this comment nor the SDEIS offers a justification for implementation of water treatment, particularly since the analysis indicates that there are no impacts to beneficial uses. The current interim monitoring program has been approved by the agencies for establishing pre-operational water quality. There

are no other monitoring stations required. There are no projected impacts to the beneficial ground water uses from the proposed land application methods.

Noranda has developed its' proposal for project wildlife mitigation in consultation with agency biologists. There are no known conflicts with agency goals or with private holdings. Modifications to the black bear hunting seasons were discussed in a report prepared by W.Kasworm and T.Manley (1988,Grizzly Bear and Black Bear Ecology in the Cabinet Mountains of Northwest Montana).

The SDEIS has provided additional information on tailings disposal alternatives, and the Little Cherry Creek site has been demonstrated to have the least impact with the best geotechnical approach.

The validity of mining claims does not come within the scope of impact analysis of the EIS.

No.202-David Cleveland-Wetlands
No.203-Amy Cleveland-Wetlands

The plant site, tailings site, access roads, powerline route, and percolation pond sites were surveyed for wetlands. Wetlands were not found at the plant site, although Ramsey Creek qualifies as Waters of the United States, nor at the percolation pond sites.

Noranda's wetland survey was field checked by the Forest Service and their wetlands consultant. The Environmental Protection Agency (EPA) and the Corps of Engineers (COE) also conducted field surveys of the Noranda wetland sites.

Periodic inundation may be consistent with the concept of wetlands hydrology, but not necessarily. Frequency and duration of inundation must be considered when evaluating wetlands hydrology. Hydrology alone is not a diagnostic criterion to identifying wetlands. Hydric soils and hydrophytic vegetation also must be present. The 1987 method of identifying wetlands requires that all three criteria (e.g. soil, vegetetion, and hydrology) must be met for an area to be a jurisdictional wetland. Many sites in northwestern Montana are inundated in the spring during snowmelt and runoff, however, areas that are periodically inundated often do not have vegetation indicating a jurisdictional wetland. Sites dominated by western red cedar and western hemlock typically do not meet the 1987 criterion for a dominance of hydrophytic vegetation.

No.204-Libby Placer Mining Co-Wetlands

The plant site, tailings site, access roads, powerline route, and percolation pond sites were all surveyed for the presence of wetlands.

Noranda's wetland survey was field checked by the Forest Service and their wetlands consultant.

No.206-NWF-Grizzly Bear Mitigation

The Endengered Species Act does not require a project proponent to insure that "the grizzly bear will be better off as a result of this mine...".

No.225-Corps of Eng-Water Treatment,Grizzly Bear,Wetlands

Norenda, as the project proponent, essumes that as the Corps had no comments to the siting, stability, and geotechnical analysis of the tailings impoundment, the Corps engineering review of the tailings impoundment dam proposal was satisfactory.

No.227-CFC-Nondegradation,Water Quality,ARD,Tailings, Monitoring,
Sensitive Species,Wetlands

The WQB was directed to cooperate in the EIS process, which analyzes impacts and alternatives. The EIS does not replace the BHES in the weighting of economic benefit, compliance with law, or maintenance of beneficial uses.

The comments to water quality assume that constituents whose detection levels are above the EPA Gold Book Guidelines will impact beneficial uses, which is an unfounded assumption.

Acid-base accounting on Montanore ore and host rock was performed to confirm the assumption that the tailings and waste will behave similarly to those et the Troy Mine.

The agencies have proposed an extensive monitoring program on account of the low levels of constituents in the baseline and in the discharge, and their assumption is that the monitoring as proposed will confirm the absence or presence of impacts. The protocol for the program will have to be developed with the monitoring data bese.

Other populations of the Northern Beechfern have been identified on the KNF, including a substantial population on the Yaak drainage.

Wetlands mitigation is under review, and it will be implemented prior to or concurrent with disturbance of existing wetlands.

No.229-EPA-Aquatic Sites,Water Quality,Air Quality

Noranda concurs with EPA that replacement of lost wetland functions on a one-to-one basis is a sound plan.

The EPA has again raised concerns about detection levels, but when the agency was pressed earlier for information on contractors and labs who could lend advice to the matter, it could not respond. The agency is commenting in support of Gold Book Guidelines which are calculated not measured, and the proponent and the agencies cannot address achievement of detection levels which are not technically available. EPA does not indicate toxicity of the low hardness levels in Libby Creek, but the objective of the monitoring program will be to evaluate if there are impacts at the site specific conditions.

EPA correspondence indicated that the AQB had answered the previous air quality questions with existing data in earlier correspondence.

No.235-MDFWP-Road Closures

Noranda admits that pedistrian access is possible on a closed road similar to all other trails, meadows, and open areas in the KNF and CMW. Perhaps MDFWP can have an open season on "homo sapiens" to inhibit this use?

No.239-C.Mills-Water Quality

This comment suggests a cost/benefit analysis for lining, collection, and treatment. The analysis that could be performed by the EIS analysis should be a resource/benefit analysis, considering the consumption of non-renewable resources, the raising of economic ore cut-off grades, the reduced project life, and the loss of employment versus a non-measureable reduction in constituent concentrations in the discharges, which are not expected to impact the beneficial uses.

No.246-CRG-Grizzly Bear,Vegetation,Rare Plants

The cumulative impacts to the grizzly bear in the CYE cannot be evaluated except for projects for which there is e proposal or are reasonably foreseeable. The impacts of the Montanore Project currently stand alone and cannot be burdened by other mining or timber development impacts for which there is no proposal.

A complete list of plant species and plant species composing plant communities is included in the Vegetation Baseline Study submitted as part of Noranda's Application for a Hard Rock Operating Permit.

Mitigation for woolgrass is not proposed because this species would not be significantly impacted by the project. A very large population of thousands of plants growing along Libby Creek would not be affected by the project.

No.247-USDOI-GrizzlyBear

This comment seems to be concerned by references to communication with USFWS on mitigation planning yet indicates that through informal consultation that the USFWS has prejudged the USFS preferred alternetive to be inadequate.

The comment raises concerns about the total project life not being defined. The project impacts will not change if the life of mine changes by a few years as project component disturbances will not change.

Noranda does not consider transfer of title of private land to be essential or even beneficial for effective habitat mitigation.

Any new housing development occuring on account of the project within Libby or the surrounding Lincoln County area will be within areas already withdrawn from grizzly bear use, and there is no mitigation required for this development.

No.248-CRG-WaterQuality

Ground water impacts will be considered by BHES during the petition process. There are no projected impacts to ground water which will impair beneficial uses.

Water quality impacts to surface water have been projected on the basis of dissolved constituent concentrations as this methodology best represents the physical conditions of the environment. The loading analysis, as pointed out in the SDEIS, is considered conservative.

No.257-LACD-WaterQuantity

The development of this project will not increase flows in Libby Creek. All of the project facilities will be located within the Libby Creek watershed, and there will be no diversion of waters either to or from other watersheds and Libby Creek.